A COMPARATIVE STUDY TO EVALUATE THE EFFECTIVENESS OF SELECTED INTERVENTIONS ON PEDICULOSIS CAPITIS INFESTATION AMONG CHILDREN IN SELECTED ORPHANAGES, SALEM.

Reg no: 301617751

PRAVEENA M

A DISSERTATION SUBMITTED TO

THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI,

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE

DEGREE OF MASTER OF SCIENCE IN NURSING

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CERTIFICATE

Certified that this is the bonafide work of **Ms. PRAVEENA M**, of Swami Vivekananda College of Nursing Dharmapuri, submitted in partial fulfilment of the requirement for the Degree of Master of Science in Nursing to the Tamil Nadu Dr.M.G.R.Medical University, Chennai. Under the registration no: 301617751

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Signature of the External Examiner with Date

AKNOWLEDGEMENT

I bow in the reverence to the Lord Almighty; the foundation knowledge of wisdom whose salutary begin benison enabled me to achieve this target.

Nursing is a noble profession and teachers who teach are equally on the same pedestal. It is initiation and guidance of my teachers and well-wishers, who gave the support in my study at all level.

I wish to express my cordial thanks with respect, honor and deep sense of gratitude to our beloved **Sister Vasantharani M.A (Psychology), B.Ed., P.G.D.B.A.,Managing Trustee, Sri Ramakrishna Vivekananda Educational and Charitable Trust,** Dharmapuri for providing me an opportunity to undertake the course.

I am very glad to express my gratitude to **Mrs. P. Neela, M.Sc., (N), M.A (S.W.A.). Ph.D (N)., Principal, Swami Vivekananda College of Nursing**, Dharmapuri, for his guidance and kind support.

I am proud and privileged to express my profound sense of gratitude to the great teacher, my research guide **Mrs Thangamani, M.Sc (N)., HOD of Child health Nursing , Swami Vivekananda College of Nursing,** Dharmapuri for his guidance, ever willing help from time to time and patient in correction, which helped me to bring this study a successful one and providing me an opportunity to undergo this PG course.

My gratitude also extended to all the **Heads of the Departmentsof SwamiVivekananda College of Nursing** for their support and guidance in bringing out this study.

I express my gratitude to orphanages **Nesackarangal and House of peace, Salem** for their permission to conduct this study in their settings.

My deep sense of gratitude to the panel of experts namely **Mrs.M.SathyakalaM.Sc (N)., Mrs.MaheshwariM.Sc (N)., Mrs.Rekha M.sc (N)., Dr.Kanagaraj M.D (DVL) ,Dr.S.R.Rani, M.D ., Chief Civil Surgeon ,Tutor in Paediatrics ,GovtMohan Kumaramangalam college ,hospital salem**. For validating the tools, amidst their busy schedule and given their valuable suggestions.

My sincere thanks to **Mr.Vengatachalam, M.Sc., M.Phil.Assistantprofessor in Bio-Statistics** who deserves the word of heartfelt thanks for his valuable opinion guidance, statistical analysis and interpretation of the data.

I would like to extend my heartfelt thanks to **Mr. M. Murthi, M.L.I.S., Librarian,Swami Vivekananda College of Nursing**, Dharmapuri for extending necessary support to collect the needed literature to complete this study.

I thanks to all the **Teaching** and **Non-Teaching staff of Swami Vivekananda College of Nursing,** Dharmapuri for their help and encouragement.

I express my heartful thanks to my parents **Mr.V.Manivannan and Mrs.M .Kalaimani** for their support throughout the study.

I am deeply indebted to my beloved Friend **Mr.R.T.Aravinth M.sc (bio tech) .,** who has given moral support, help, care and concern considerably light ended the burden and who prayed for my successful completion of the project.

I express my sincere gratitude to all my friends and classmates for their love, support and prayer.

Ms.*praveena *M

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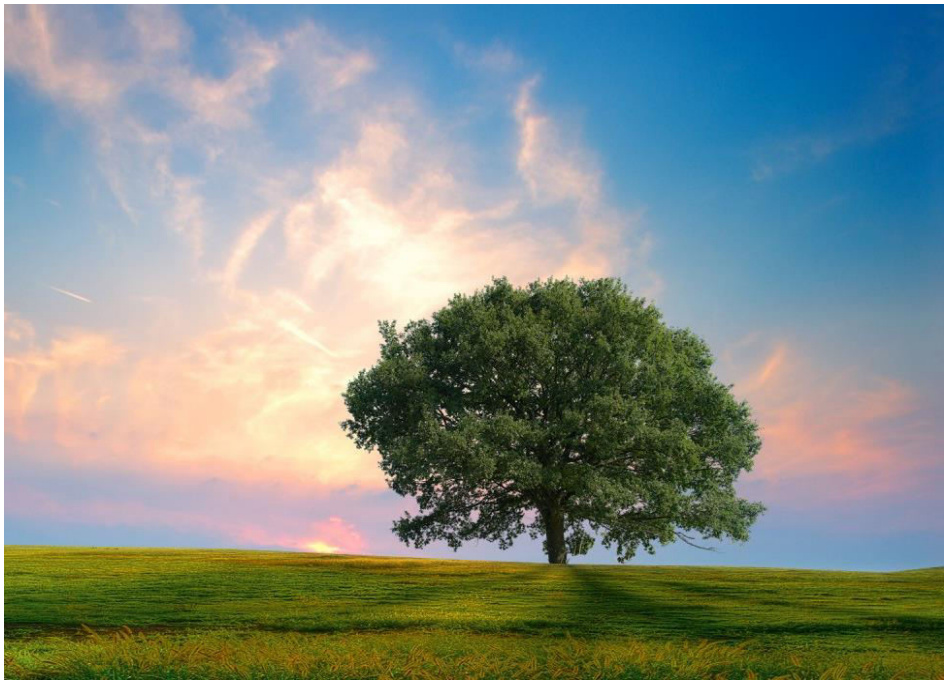

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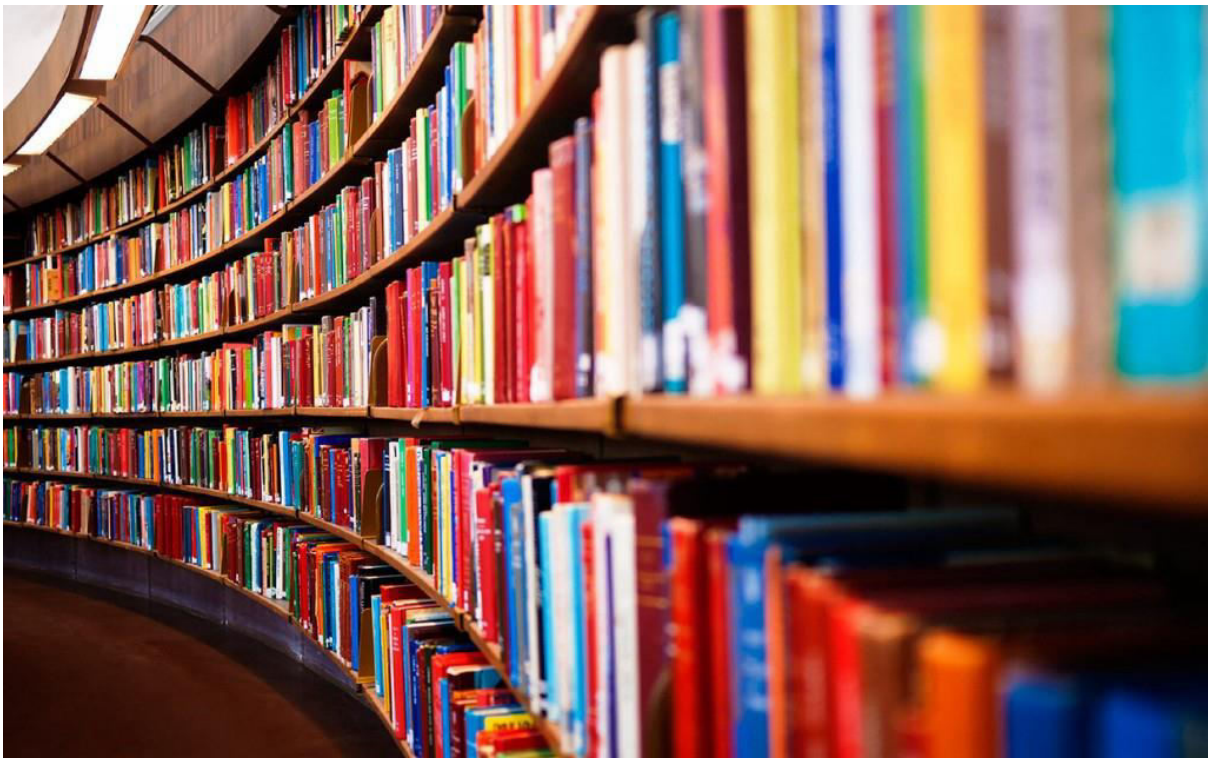

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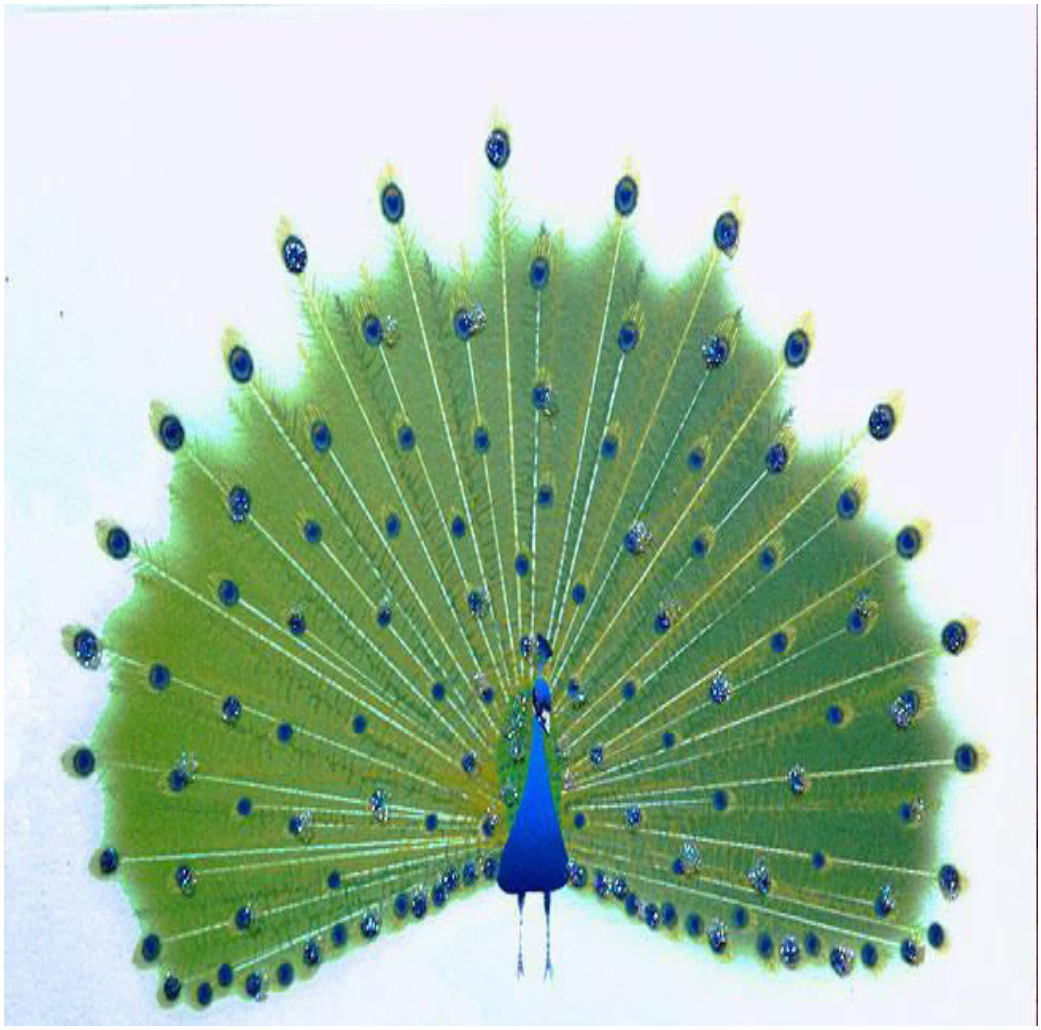


Thank you

CHAPTER – I

INTRODUCTION

School-age children have a relatively accurate and positive perception of their physical selves, but in general they like their physical selves less as they grow older. The head appears to be the most important part of the school-age child's perceived image of self, with hair and eye color the characteristics used most frequently to describe the physical self **(Marilyn, J. H. et. al., 2017).**

In United States, pediculosis capitis infestation is very common among children at 3 to 12 years of age group and each year nearly 6 to 12 million have infestations. Head lice are not a health hazard or a sign of uncleanliness and are not responsible for the spread of any disease **(Frankowski,B.L. et.al., 2015).**

Lice are blood sucking parasites of human being. These are wingless obligate ectoparasites of humans, which affects millions of children worldwide, especially those in the 5-11 years of age group **(Dawarbanah, M.A. et. al., 2009).**

There are several types of pediculosis treatments in the market. All of those pediculicide agents act efficiently against the adult head lice and less efficiently against nits. The treatments for pediculosis capitis are mainly fall into three categories. They are medicinal products, medical devices, and traditional remedies. Majority of the registered medicinal products contain many neurotoxic insecticides as the active ingredients. However, recent trends for product development have changed this pattern so that in some countries medicinal products now contain active substances that act by physical means **(Burgess,I.F., 2009).**

Neem tree is considered a "village pharmacy" because of the well-established fact that every part of the tree has an application in curing human diseases. Traditional Ayurvedic uses include the treatment of acne, fever, leprosy, malaria, and tuberculosis.

Various folk remedies of neem include use as an anti helmintic, anti septic, diuretic, parasiticide, pediculicide, and insecticide **(Puri, 2012).**

Neem oil is not used for cooking reasons. But, in India and Bangladesh, it is used to prepare cosmetics (Soaps, hair products, body hygiene creams and hand cream).The recommendation is to use undiluted neem oil for head lice. Yes, the use of undiluted neem oil is recommended only in head lice infestation. A very untidy and stinking operation. Although, no matter how stinking, a natural medicine for head lice is still much preferable to the vicious chemicals that would otherwise need.

One of the most useful tools for the prevention and control of lice is the louse comb. Louse comb should be used often for the recognition of living lice at an early stage of infestation, and as an accessory to any treatment process to take away living and dead lice. The louse comb can also be used thoroughly for the treatment of infestations, for affirmation that treatment with pediculicides has been successful, and to takeaway the nits **(Mumcuoglu, K.Y., 2010).**

None of the pediculicides is 100% effective in killing all the eggs, the makers of some pediculicides recommend manual removal of the nits after treatment. An extra-fine-tooth comb that is included in many commercial pediculicides or is available at community pharmacies facilitates manual removal **(Centers for Disease Control and Prevention, 2005).**

The most familiar symptom is itching. Individuals with head lice infestation may scratch the scalp to lighten itching. And rarely this will lead to secondary bacterial skin infection. Head lice are the cause of much shame and misunderstanding, many unnecessary days of absence in school and work, and millions of dollars spent on remedies **(Frankowski, B.L. et.al., 2013).**

India has more children (83.3%) than China and at the same time relatively low attendance rates, in spite of recent increases in primary and secondary school participation **(Huebler, F., 2013).**

Concern about student absenteeism related to repeated pediculosis infestations and the resultant risk for unsuccessful school achievement led to a quality improvement program comprised of 6 projects. The goal was to recognize efficient nursing interventions for children and families incurring frequent infestations. One project addressed the frequency of infestation, frequency of school exclusion, and duration of consequential lost school days. Confirmed were low infection in classrooms and numerous social and emotional challenges in students having chronic infestations **(Janis Hootman, 2012).**

The American Academy of Pediatrics and the National Association of school Nurses discourage a "no-nit" policy for schools. The problem is that all nits are often are not eliminated by treatment, but the nits left after treatment are inactive or dead, and harmless. So children with headlice should be allowed to return to school after proper treatment **(Frankowski and Weiner, 2002).**

NEED FOR THE STUDY:

Head louse are found in all human population, with a higher prevalence in developing countries. In the United States, there is a higher prevalence in children than adults, having peak prevalence at 4-11 years. There is a higher incidence of infestation in long and medium length hair as compared to short hair and the male to female ratio is 1:2.

Headlice infestation was diagnosed by direct inspection of hair and scalp **(Hipolito, R.B. et.al., 2000).** There is no need for costly diagnostic methods to identify the pediculosis capitis infestation.

Formulations containing 5% acetic acid or 8% formic acid, in addition to acid shampoos (pH 4.5 to 5.5) and conditioners, in combination with a louse comb, can be useful to remove nits. There is no conclusive evidence that using essential oils to repel lice is effective **(Mumcuoglu, K.Y., 2005).**

There are rising numbers of treatment failures due to the appearance of treatment-resistant lice to the trendy over-the-counter products that have been used for the past some decades. Based on concerns about safety and decreasing efficacy due to resistance, a reassessment of the general topic of pediculicides for head lice is warranted **(Burkhart, C.G et.al.,2006).**

As the occurrence and level of pediculicide resistance increases all over the world, the need for new solutions to control pediculosis has intensified. The expansion and registration of new pesticides has turn into so costly that many chemical companies are reluctant to follow it and health-care providers now face a serious lack of new commercial pediculicides **(Takano-Lee, M. et.al.,2004).**

Insecticide-resistant head louse infestations are probably much more common than is generally realized and may persist unnoticed, so that more aggressive approaches will be needed to eradicate these ectoparasites from individuals and communities **(Bailey, A.M. et.al.,2000)**

The morbidity associated with pediculosis is related to the social stigma attached to each of the 3 types of infestation. Pruritus, bite reactions, and secondary skin infections can also cause significant morbidity **(Lyn Guenther, et. al.,2010).**

The increasing incidence of pediculosis in children is a serious concern for school nurses, parents, and community health agencies. However, school head lice screening programs have not proven to have a significant effect on the incidence of headlice in the school setting; parent education programs may be more helpful in the management of

headlice. An important nursing role is educating the parents about pediculosis. Nurse should emphasize that anyone can get pediculosis; it has no respect for age, socioeconomic level, or cleanliness **(Hockenberry, M.J. et.al.,2009).**

Children are cautioned against sharing combs, hair ornaments, caps, hats, scarves, coats, and other items used on or near the hair. Hygienic controls of schoolchildren by nurses are important in the abolition of Pediculus humanus capitis. The occurrence of pediculosis decreased with rising life standards, i.e. with high income, accessibility and consumption of water and improved health care systems. The study findings showed that occurrence of pediculosis capitis depends on the age and sex of the schoolchildren and their living circumstances **(Alicja Buczek ,2003).**

In order to decrease the proportion of children infested with head lice and retard the emergence of strains of lice opposed to pediculicides, more active involvement of health and educational authorities, as well as parents is very important. The pharmaceutical industries should aspire to commence pediculicides based on new chemical compounds, particularly natural products. Companies should develop efficient and safe repellents and nit removal remedies. **(Barker, S.C. et al.,2007).**

The progress and registration of new pesticides has become so costly. Many infested people alternative to using home remedy approaches that have not been scientifically tested. The topical compounds based on insecticidal chemicals are the mainstay of head lice treatment, but resistance is increasing, alternatives, such as herbs and oils are being sold to treat head lice. In India neem is a well-known and commonly used medicinal plant for various treatment, it is very low cost and easily available.

In orphanages lice spread easily among children, because they are having close contact with each other due to overcrowding and poor living conditions. The children may develop severe infestation if unnoticed, and will develop a secondary skin infection

from scratching and abrasions due to itching. The neem oil and vinegar is easily available and affordable for the Indian population.

As the frequency and level of pediculicide resistance increases through out the world, the need for novel solutions to control pediculosis has intensified. Therefore, the investigator was interested to evaluate the effectiveness of neem oil and vinegar on pediculosis capitis infestation among the children in selected orphanages.

STATEMENT OF THE PROBLEM:

A Comparative study to evaluate the Effectiveness of Selected Interventions on Pediculosis Capitis Infestation among Children in Selected Orphanages, Salem.

OBJECTIVES:

- To assess the severity of pediculosis capitis infestation among children of experimental group-I and II in selected orphanages.
- To compare the effectiveness of selected interventions on pediculosis capitis infestation among children of experimental group-I and II in selected orphanages.
- To associate the severity of pediculosis capitis infestations among children of experimental group-I and II with their selected demographic variables.

OPERATIONAL DEFINITIONS:

Effectiveness

It refers to the statistically significant difference in the pediculosis capitis infestation among children in experimental group-I and II after the use of selected interventions.

Selected interventions

It refers to the application of neem oil and combing the hair with vinegar dipped comb in experimental group-I and hair washing with Medikar shampoo and combing in experimental group-II.

Pediculosis capitis infestation

It refers to the infestation of head louse, which may further lead to itching of the scalp and assessed by observational checklist.

Children

It refers to the school-going children between the age group of 6-12 yrs.

ASSUMPTIONS:

- The school-going children in the orphanage may have the pediculosis capitis infestation.
- Pediculosis capitis infestation may lead to complications if they are not adequately cared for the infestation.
- Neem oil and vinegar may have some effect on pediculosis capitis.

HYPOTHESES:

H_1: There will be a significant difference in the severity of pediculosis capitis infestation among children of experimental group-I and II at $p \leq 0.05$ level.

H_2: There will be a significant association in the severity of pediculosis capitis infestation among children of experimental group-I and II with their selected demographic variables at $p \leq 0.05$ level.

DELIMITATIONS:

1. The study was limited to children with pediculosis capitis infestation only.
2. The study was limited to children residing at selected orphanages of Salem.
3. The study period was limited to only 4 weeks.

4. The sample size was limited to only 60 children.

PROJECTED OUTCOME:

This study will be conducted to compare the effectiveness of selected interventions on pediculosis capitis infestation. Findings of the study will help to practice these selected interventions for the treatment of pediculosis capitis infestation.

CONCEPTUAL FRAME WORK

The researcher adopted Imogene King's goal attainment theory (1981) based on the personal and interpersonal systems including interaction, perception, judgment, communication and transaction. The investigator adopted goal attainment as a basic theory for conceptual framework, which is aimed to effectiveness of selected interventions on pediculosis capitis infestation. This involves interaction between the researcher and the children in the selected orphanages.

SIX MAJOR CONCEPTS

Perception

It refers to people's representation of reality. Here the researcher and the children perceived the need of selected interventions to treat the pediculosis capitis infestation.

Judgement

Judgement is decision, which is made. Here the researcher decides to provide selected interventions to treat the pediculosis capitis infestation and the children decide to participate in the research study.

Action

This refers to the changes that have been achieved. The researcher action to provide selected interventions to treat the pediculosis capitis infestation and children decided to receive the treatment.

Reaction

Reaction helps in setting a mutual goal. In this study, the researcher and the children set a mutual goal. Here the mutual goal is to treat the pediculosis capitis infestation with selected interventions.

Interaction

It refers to the verbal and non-verbal communication between one individual or between two or more individual who involve goal directed perception. Here the researcher encourages the children in the selected orphanages to receive the selected interventions to treat the pediculosis capitis infestation.

Transaction

This is the achievement of a goal. Here the researcher's goal is achievement of reduction in severity of pediculosis capitis infestation, and to compare the effectiveness of selected interventions on pediculosis capitis infestation by using observation checklist.

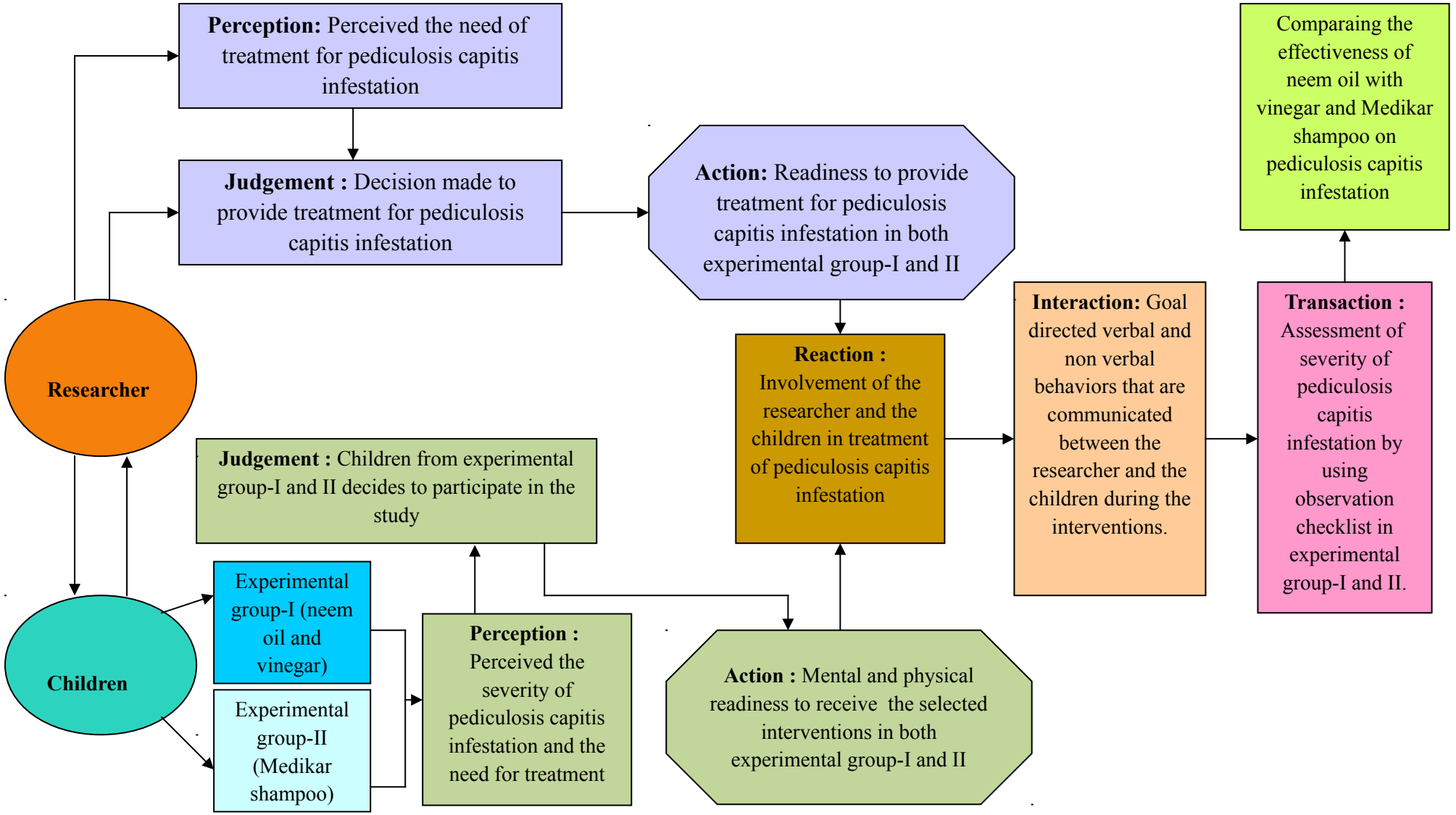


FIGURE 1.1: CONCEPTUAL FRAME WORK BASED ON IMOGENE KINGS GOAL ATTAINMENT THEORY (1981)

SUMMARY

This chapter dealt with intro.duction about pediculosis capitis infestation, need for the study, statement of the problem, objectives of the study, operational definitions, assumptions, delimitations, projected outcome and conceptual framework for the study.

CHAPTER II

REVIEW OF LITERATURE

This chapter presents a review of selected literature relevant to the present study. Review of literature is an important step in the development of the research project, and in broadening the understanding and developing an insight into the problem area. It further helps in developing the broad conceptual context, in which the problem fits, methodology, instruction of tool, development of evaluative approach and analysis of data.

Related Literature were Reviewed and Organized under the Following Headings

- Literature related to Pediculosis capitis infestation
- Literature related to prevalence of Pediculosis capitis infestation
- Literature related to chemical products on Pediculosis capitis infestation
- Literature related to non-chemical products on Pediculosis capitis infestation
- Literature related to home remedies on Pediculosis capitis infestation
- Literature related to insecticide resistance
- Literature related neem and vinegar

Literature related to Pediculosis Capitis Infestation

Thomos.T, (2018) said that pediculosis is an infestation of lice in the body. The most common cause of pediculosis is head lice, Pediculus humanus capitis. It is a condition often seen in school age children those who have close contact with someone who has an infestation of head louse.

Adam O Goldstein, et.al., (2018) stated that head lice often affect children. In a study, approximately one of every four elementary-level students in the United States had infested with head lice. This is because lice are easily spread, when

children play together, from articles of clothing on adjacent hooks in classrooms, on shared combs, headphones, towels, and beds.

Rebecca J. Frey & Margaret Alic, (2018) stated that head lice live and creep on the scalp, and it will be sucking blood every three to six hours. Their claws are modified for clinging to hair or clothing. Adult head lice can be silvery-white to reddish-brown in colour. They are regarding the size of a sesame seed. Female lice lay their eggs in sacs called nits that are about 0.04 inch (1 mm) long. They are glued to shafts of hair close to the scalp. During the one-month duration, a female louse may lay more than 100 eggs. The nymphs hatch in three to 14 days and must nourish on blood within one day.

Mumcuoglu, K.Y. **et.al., (2017)** reported about the international guiding principle for effective control of head louse infestations. Head louse infestations are growing or remain high in nearly all countries. In order to reduce the percentage of children infested with head lice and to slow down the emergence of strains of lice resistant to pediculicides, more active participation of health and educational authorities, as well as parents, is of supreme importance. The researchers suggest that health authorities should initiate more efficient methods for evaluating pediculicides and more strict regulations for adoption of new anti-louse products. Baseline studies are also necessary for new pediculicides. Children should be properly screened, especially in challenging areas.

Literature related to prevalence of headlice

Motovali-Emami, M. et.al., (2016) conducted a study on epidemiological aspects of Pediculosis Capitis and treatment evaluation in 40586 primary-school children in Iran. This study was undertaken to assess the prevalence of and epidemiological factors associated with, headlice infections in Iranian primary schools

in 2006. The results showed that the overall prevalence of headlice infestation was 1.8%. The prevalence of infestation is higher in girls (2.9%) than in boys (0.6%).

Essam, et.al., (2016) conducted an observational descriptive study in Sohay regarding incidence and the epidemiological factor related to pediculosis capitis infestation among 1402 pupils of 3 primary school by convenient sampling. The results showed that 224 samples proved to be infested with pediculus humanus capitis, a rate of 15.98% distributed between the 3 schools.

Alicja Buczek, (2012) conducted a comparative study to assess the frequency of pediculosis capitis infestation among 95,153 schoolchildren in the rural and urban communities of Lublin Province (eastern Poland). On the whole rate of pediculosis capitis infestation differs considerably between rural (1.59%) and urban (0.48%) schools in eastern Poland. Children between the age group of 8 and 12 years were most commonly infested. Pediculosis was observed most commonly in girls in both the urban (63.5%) and rural (75.3%) schools. The results confirmed that pediculosis capitis is still a problem in different environments, particularly with lower life standards and poorer financial conditions of health care.

Patrick Boyle, (2011) conducted a study on prevalence of headlice infestation in Saudi Arabia. The sample size was 300 children attending the OPD over a period of 2 months. The researcher examined three hundred consecutive children attending the general practioner for any reason. In that 37 cases of active infestation found, which was an overall prevalence of 12%. The infestation of 30 % was in the age group of 6-8 years and 16 % in the age group of 10 years. These results show a high headlice infestation, particularly in the early school years.

A survey conducted by **WHO (2000)** shows the prevalence of headlice in the following states. The prevalence of infestation was 10.7% in Malaysia, 12.9% in

Kuala Lumpur, 41.5% in Selangur, 5.34% in Tanzania, 66.5% in Ethiopia, & 56.6% in India. The survey conducted in Kuala Lumpur (28.3%) and Selangur (51.8%) shows that the highest rate of infestation was among Indian ethnic groups. The infestation is more common in economically poor children (34%). The average age of infested individual was 12.5 years and infestation was more common among girls (34.4%).

William, R. et.al., (2000) conducted a prospective cohort study on "lice, nits and school policy" in two metropolitan Atlanta. The samples include 1729 children who were selected by random sampling. The purpose of the study was to identify the risk factor for the conversin of the nits into lice. The result showed 7 of 22 children (31.8%) with >5 nits within ¼ inch of the scalp was converted, compared to 2 of 22 children (7%) with fewer nits. The concluded that having >5 nits within ¼ inch of the scalp was risk factor for conversion.

Literature related to chemical products on headlice

Pearlman, D.L., (2014) conducted an open clinical trial study regarding simple treatment for headlice: Dry on suffocation based pediculicide, in Brazil. The sample size was 133.They assessed the efficacy of dimeticone based pediculicide lotion, as compared to 1% permethrin lotion. The result showed that the cure was achieved for 97% patients in first trial and 95% in the second trial. There were no side effect and concluded as, dimeticone based pediculicide lotion effectively treats headlice without neurotoxins.

Sim, S. et.al., (2013) conducted a survey on head lice infestation in Korea (2001). The purpose of the study was to find the therapeutic efficacy of oral trimethoprim/sulfamethoxazole adding to lindane shampoo among 7,495 children including 3,908 boys and 3,587 girls from a kindergarten. One group was treated with

1 % lindane shampoo and another one group was treated with 1% lindane shampoo and oral Trimethoprim/Sulfamethoxazole. The result showed that there is no statistically significant synergistic effect for the combination of 1% lindane shampoo and oral trimethoprim/sulfamethoxazole.

Patridge, S.K. et.al.,(2010) conducted a study on efficacy of 1% Permethrin for the treatment of head louse infestation among in Kosovar. Total of 1051 refugees screened for head lice infestation. In that 107(10%) were infested. Crawling lice were observed on 62(6%) of the individuals examined. Refugees with crawling lice treated with a pediculicide containing 1% Permethrin. Of these 57 examined 7 days after treatment. The results show that no crawling lice found on any of the refugees examined after the treatment and they concluded that 1% Permethrin treatment was effective in lice control.

Literature related to non-chemical products on headlice

Ibarra, J. et.al., (2009) conducted a study on overcoming health inequalities by using the Bug Busting 'whole-school approach' to eliminate headlice in UK. The results showed that best results can obtain when each family has a Bug Buster Kit. This provides the entire combs essential with full information on their use with usual shampoo and conditioner to detect lice, eliminate an infestation mechanically. The study concluded that in UK, the promotion of the Bug Busting approach might decrease primary care expenses on treatment for head lice and professional time spent with troubled parents.

Speare, R. et.al.,(2007) conducted a comparative study on effectiveness of two nit combs, plastic with cylindrical teeth (Lady Jayne comb) and metal with rectangular teeth (Lice Meister comb) in removing head lice and their eggs after the treatment with pediculicide. The hair of 27 children was separated into two sections

sagitally, and each comb was randomly assigned to one half of the hair, and the lice and eggs detached by the combs were counted. The result showed that the Lice Meister comb is more efficient comb to use in controlling head lice infestations, whether in use with conditioner or with insecticide treatment.

Bradgoates, M. et. al., (2006) conducted an experimental study on an effective non chemical treatment for headlice in Salt Lake City. The study was conducted among 169 individuals. The purpose of the study was to find out the effective treatment method from 6 different treatment methods. Each method delivered hot air into the scalp in a different way and performed follow up. The result showed all the 6 methods resulted in high egg mortality (>85%) and showed more variable success in killing hatched lice. The most successful method, which used a custom-build machine called, the louse buster resulted in nearly 100% mortality of eggs and 80% mortality of hatched lice.

Literature related to home remedies on Pediculosis Capitis Infestation

Toloza, A.C. et. al., (2010) conducted a study on efficacy of Eucalyptus essential oil against permethrin-resistant pediculus humanus capitis (Phthiraptera: Pediculidae) from Argentina. The objective of the study is to find out the alternative pediculicide effect of Eucalyptus oil. The study results show that Eucalyptus essential oils showed to be effective against head lice and classified as safer compounds due to their low toxicity to mammals, they can be employed into pediculicide formulations.

Takano-Lee, M. et. al., (2004) conducted a study on home remedies to control head lice: assessment of home remedies to control the human head louse, Pediculus humanus capitis (Anoplura: Pediculidae). The purpose of the study was to examine the potential value of six "home remedies" such as vinegar, isopropyl alcohol, olive oil, mayonnaise, melted butter, and petroleum jelly to treat head lice

infestations. Results indicated that only the appliance of petroleum jelly caused considerable louse mortality but no treatment banned lice from laying eggs.

Kayali, M. et. al., (2003) conducted an experimental study in Queensland on cream containing 20% of custard apple (Annona squamusa seed) compared with 25% Benzyl Benzoate emulsion among 22 primary school children. One of the two treatments was applied to the head of the schoolchildren (n=11 per treatment group). In the group treated with custard apple cream 89%-99% of the lice were dead, while only 47%-60% were dead in Benzyl Benzoate group. No adverse events detected in custard apple cream group, however skin irritation reported in the Benzyl Benzoate group. Therefore, the researcher concluded that cream containing custard apple extract is effective in treating the headlice without side effects.

Mumcuoglu, K.Y. et. al., (2002) conducted a comparative study on the pediculicidal efficacy of a natural remedy (which contains coconut oil, anise oil and ylang ylang oil) and control product (spray formulation containing Permethrin, Malathion, Piperonyl Butoxide, Isododecane). They selected 119 children, aged 6-14 years, from six schools in Jerusalem. Altogether, 119 children treated randomly with either the natural remedy or the control product. The result shows that treatment was successful with the natural remedy in 60 children (92.3%) and with the control product in 59 children (92.2%). The study concluded that the natural remedy was very effective in controlling louse infestations under clinical conditions and caused no serious side effects.

Literature related to insecticide resistance

Burkhart, C.G. et. al., (2006) conducted a study on safety and efficacy of pediculicides for head lice in US. The objective of the study is to find a safe and effective pediculicide for headlice. Resistance has decreased the efficacy of lindane, a

prescription pediculicide that has been commonly used for several generations. Malathion, newly reintroduced in the US as a recommendation pediculicide, has been connected with some treatment resistance depending upon its formulation. The study results showed that to find out the safety and decreasing efficacy due to resistance, a reassessment of the general topic of pediculicides for head lice is warranted.

Downs, A.M. et. al., (2002) conducted a study on widespread insecticide resistance in head lice to the over-the-counter pediculicides in England, and the emergence of carbaryl resistance. The efficacy of 1% carbaryl lotion compared in children in Bristol and Leeds. The data recommend head lice resistance is present in many parts of England to over-the-counter products containing artificial insecticides (Permethrin, Phenothrin and Malathion). They further suggest that resistance is starting to develop to carbaryl in head lice in Leeds,UK and that extensive use of this product would lead to significant resistance.

Bailey, A.M. et. al., (2000) conducted a study on persistent headlice following multiple treatments: evidence for insecticide resistance in Pediculus humanus capitis. The purpose of the study was to find the resistance after multiple treatments. Viable head lice found on the scalps of two family members following multiple topical insecticide treatments. The result shows that the insecticide-resistant head louse infestations were probably much more common than it generally realized and may persist unnoticed, so that approaches that are more aggressive will be needed to eradicate these ectoparasites from individuals and communities.

Literature Related Neem and Vinegar

According to **Medic magic, (2010)** neem oil is a vegetable oil pressed from the seeds of Azadirachta indica, an evergreen tree. It is endemic to the Indo-Pakistan sub-continent and has been introduced to many other areas in the tropics. Neem oil is

generally light to dark brown in colour, bitter in taste and has a rather strong odor that is said to merge the odors of peanut and garlic. It comprises mainly triglycerides and large amounts of triterpenoid compounds, which are accountable for the bitter taste**.**

Abdel-Ghaffer, et. al., (2007) conducted an experimental study on efficacy of neem seed extract shampoo on headlice among 60 naturally infected children in Egypt. The purpose of the study was to assess the effectiveness in 3 different intervals (10, 15 and 30 minutes). The shampoo thoroughly applied on the wet hair and rubbed into reach skin of the scalp. After 10, 15, and 30 minutes, the shampoo was washed out and the hair basically combed. Headlice were collected and examined. The result show that the neem seed extract shampoo proved to be highly effective against all stages of headlice. No differences were observed between an exposure time of 10, 15 and 30 minutes.

Vinegar Connoisseurs International, (2006) stated that the nits are so small and their stick so strong and they cannot combed out simply from hair. It is recommended to follow that after shampooing, rinse the infected area head thoroughly with white vinegar. The acetic acid in the vinegar will disband the glue holding eggs to the hair. So as to get rid of all remaining lice eggs, use a fine-toothed comb to comb out the complete head of hair.

U. P. Singh, **et.al., (2005)** revealed that the neem tree has been a constant source of novel and structurally unique phytochemicals that can comprise the basis for the progress of novel pharmaco-therapeutic agents against various human diseases. Being a trial product for the progress of safer drugs and ecofriendly, pro-human health agrochemical agents against a vast range of plant diseases, the tree always remains in the center of safe herbal drug and pesticide progress in the service of mankind**.**

Singh, U.P. et al.,(2002) said that, neem oil also contains steroids (Campesterol, Beta-Sitosterol, Stigmasterol) and a plethora of triterpenoid of which Azadirachtin is the most well known and studied. It also contains the acids like Linoleic acid, Oleic acid, Hexadecanoic acid, Octadecanoic acid, Alpha-linolenic acid, 9-Hexadecenoic acid**.**

Summary:

The literature highlights the presence of headlice as a problem all over the world. Several intervention studies conducted with several products to ensure their effectiveness to tackle the problem of headlice. However, the studies on natural product are limited. The studies cited in this chapter have found very useful in designing the present study.

CHAPTER - III

METHODOLOGY

This chapter consists of research approach, research design, population, description of the setting, sampling, variables, description of the tool, validity and reliability, pilot study, method of data collection, and planned data analysis.

RESEARCH APPROACH

Quantitative evaluative research approach was used in this study.

RESEARCH DESIGN

Research design refers to the researchers overall plan for obtaining answers to the research question and it spells out the strategies that the researchers adopts to develop information that is adequate (Polit, D.F. and Hungler, 2003).

Quasi experimental (pre-test post-test) research design was used in this comparative study to evaluate the effectiveness of selected interventions on pediculosis capitis infestation among the children.

E_1 : O_1 X_1 O_2

E_2 : O_1 X_2 O_2

E_1 : Experimental group-I

E_2 : Experimental group-II

O_1: Pre-test on severity of pediculosis capitis

O_2: Post-test on severity of pediculosis capitis

X_1 : Application of neem oil and combing with vinegar dipped comb

X_2 : Hair wash with Medikar shampoo and combing

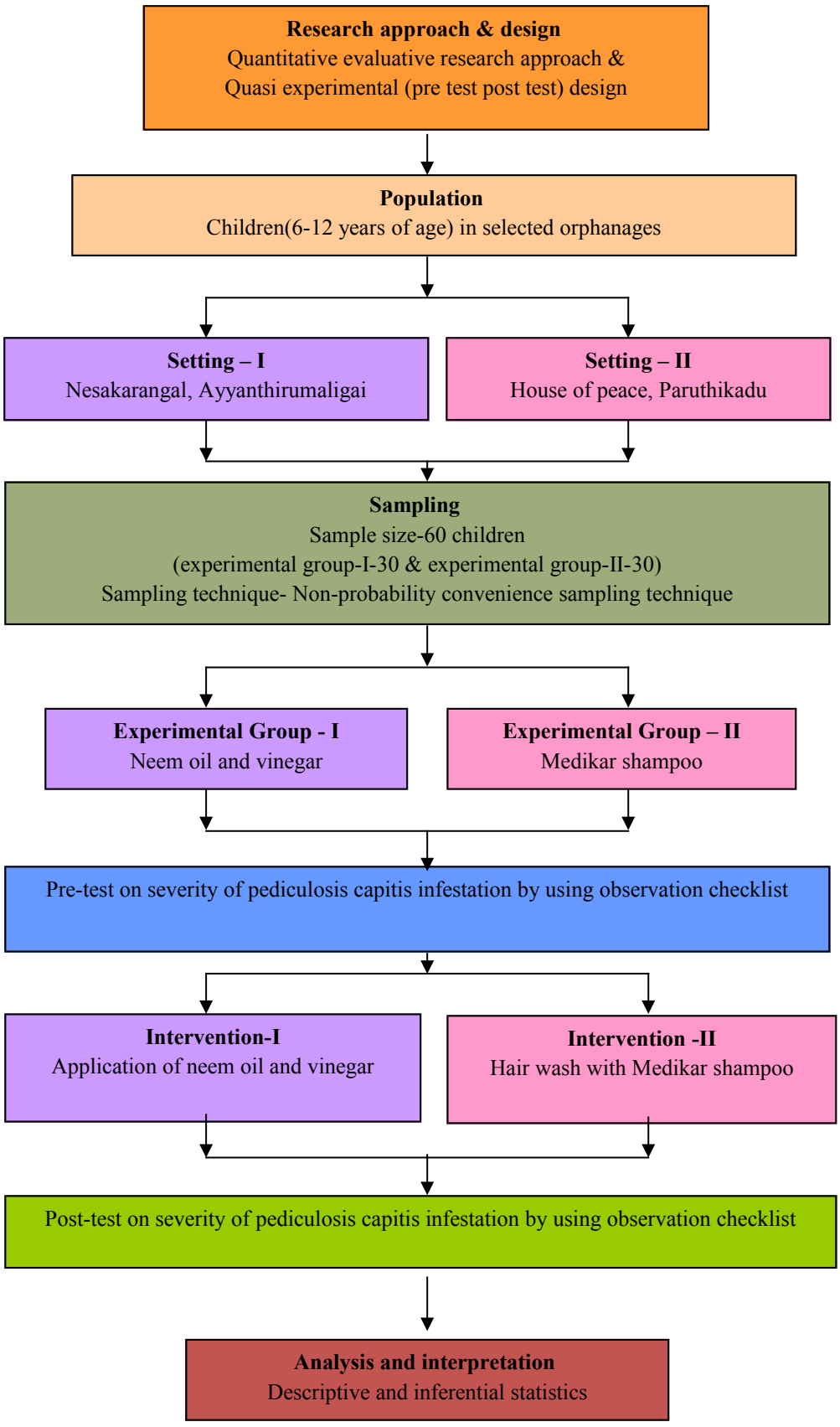


Fig – 2: Diagrammatic Representation of Research Methodology

POPULATION

Population refers to all elements that meet criteria for inclusion of a study (Burns, N and Groove, 1997).

The population of this study was the orphanage children between 6-12 years of age. They were 180 children in the orphanages between the age group of 6-12 years of age.

DESCRIPTION OF THE SETTING

The study was conducted in 2 orphanages at Salem. The experimental group-I was selected from Nesakarangal at Ayyanthirumaligai which is about km away from Swami vivekanandha College of Nursing and the experimental group-II was selected from House of Peace at Paruthikadu which is about km away from Swami vivekanandha College of Nursing, Dharmapuri.

SAMPLING

Sample

Children with pediculosis capitis infestation in the selected orphanages and those who met the criteria.

Sample size

The sample size was 60 orphanage children with pediculosis capitis infestation. Among them 30 children in experimental group-I and 30 children in experimental group-II.

Sampling technique

Non-probability convenience sampling technique

Criteria for sample selection

Inclusion criteria

- School going children mbetween 6-12 years of age group.
- Female children those who are willing to participate.
- Children suffering from pediculosis capitis infestation.

Exclusion criteria

- Children with any scalp infections.
- Children with scalp injuries.
- Children with any serious medical illness.

VARIABLES

Independent variables: Neem oil with vinegar and Medikar shampoo.

Dependent variable: Pediculosis capitis infestation among children.

DESCRIPTION OF THE TOOL

The tool consists of two sections.

Section A: This section deals with the general information like age, education, number of persons in one room, use of separate comb, frequency of hair wash and number of shampooing per week.

Section B: This section deals with the observation checklist tool to assess the severity of pediculosis capitis infestation like stages of the lice, generalized itching of scalp and nape of neck, visualization of nit found with in ½ inch of the scalp, visualization of nymph or adult lice and cervical lymphadenopathy.

Scoring procedure for severity of pediculosis capitis infestation

There were 9 items pertaining to severity of pediculosis capitis infestation. Each item carries 2 options ‘yes or no’, with scores 1or 0 respectively.

Table 3.1 Interpretation of scoring procedure

Severity of pediculosis capitis infestation	Actual score	Percentage
Mild infestation	0-3	0 – 33.33%
Moderate infestation	4-6	44.44 – 66.66%
Severe infestation	7-9	77.77 – 100%

VALIDITY AND RELIABILITY

Validity of the tool was established with the consultation of the guide and 8 experts. The experts were from the field of Community Health Nursing, Medical and Surgical Nursing, Child Health Nursing and Medicine. Modifications given by the experts were incorporated.

Reliability of the observation checklist was established by implementing the tool for 6 children with pediculosis capitis infestation through the inter-rater method and the reliability co-efficient was $r^1 = 0.09$, which showed that the tool was reliable. Hence, the tool was considered for proceeding.

PILOT STUDY

Pilot study was conducted for the period of one week from 24-03-2018 to 31-03-2018 among 6 children with pediculosis capitis infestation to assess feasibility and practicability of the study. A formal permission was obtained to conduct the pilot study in two orphanages, Nesakkarangal at Ayyanthirumanigai and House of Peace at Paruthikadu. Three children from each group were assigned to experimental group-I and II by using non probability convenience sampling technique.

The finalized tool was administered. The collected data were analyzed by using descriptive statistics. Tool was feasible and the children easily followed the instruction and co-operated. It also helped to select suitable statistical methods.

Method of Data Collection

Ethical consideration

Written permission was obtained from the authority of the two orphanages Nesakarangal in Ayyanthirumaligai (Experimental group-I) and House of peace in Paruthikadu (Experimental group-II).

Then the investigator selected 30 children with pediculosis capitis infestation from each orphanage and obtained oral consent from the children to participate in the study.

Period of data collection

The data collection was done for a period of 4 weeks from 02-04-2018 to 30-04-2018

DATA COLLECTION PROCEDURE

The investigator collected the demographic data and assessed the severity of pediculosis capitis infestation of both the groups by using observation checklist. After the pre-test, for experimental group-I, the investigator applied neem oil on the scalp and combed the scalp after 10 minutes with the vinegar-dipped comb to remove the louse, then washed the hair with shampoo. The investigator provided the intervention twice per week. For the experimental group-II the investigator applied Medikar shampoo during the hair wash and combed the hair. The investigator provided the intervention once in a week as given in the usage direction and conducted the post-test for both the groups on 29-04-2018 to 30-04-2018.

PLAN FOR DATA ANALYSIS

The data will be collected, arranged, tabulated and analyzed according to the objectives of the study by using descriptive and an inferential statistics.

SUMMARY

This chapter dealt with research approach, research design, settings, variables, population, sampling technique and sample size, criteria for sample selection, description of tool, validity and reliability of the tool, data collection procedure, pilot study and plan for data analysis. The analysis and interpretation of the study are presented in the following chapter.

CHAPTER – IV

DATA ANALYSIS AND INTERPRETATION

Analysis is a "process of organizing and synthesizing data in such a way that research questions can be answered and hypothesis tested" (Polit, D.F. and Hungler, 1999).

The term analysis refers to the computation of certain resources along with searching for patterns of relationship that exists among data groups.

The present study attempted to evaluate the effectiveness of selected interventions on pediculosis capitis infestation among children at selected orphanages, Salem. The data analysis contains three major sections. The data collected were organized, coded, calculated and analyzed as per objectives of the study.

DATA COLLECTED AND ANALYZED BY THE FOLLOWING SECTIONS:

Section-A: Distribution of children according to their demographic variables.

Section-B: Distribution of children according to the severity of pediculosis capitis infestation before intervention.

Section-C: Comparison of severity pediculosis capitis infestation before and after the interventions among children in experimental group-I and II.

HYPOTHESIS TESTING

Section-D:

- Mean, Standard Deviation and 't' value of effectiveness of selected interventions on pediculosis capitis infestation among children in selected orphanages.
- Association between the severity of pediculosis capitis infestation and their selected demographic variables.

SECTION-A

DISTRIBUTION OF CHILDREN ACCORDING TO THEIR DEMOGRAPHIC VARIABLES

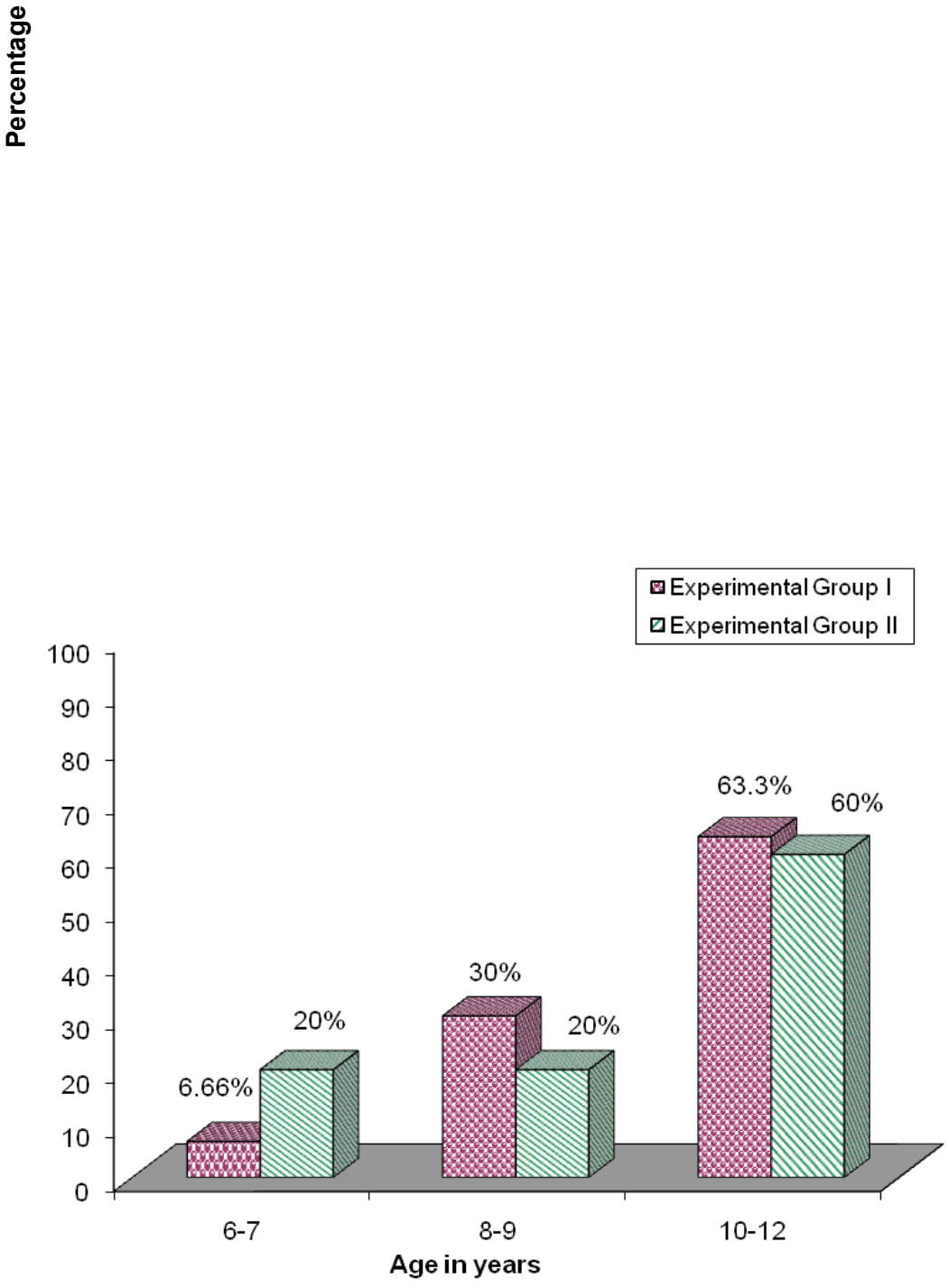


Figure 4.1: Distribution of children according to their age in years

The above figure shows that highest percentage of children, 19 (63.3%) in experimental group-I and 18 (60%) in experimental group-II were in the age group of 10-12 years.

The lowest percentage of the children, 2 (6.66%) were in the age group of 6-7 years in experimental group-I, whereas in experimental group-II, equal percentage of children 6 (20%) were in the age group of 6-7 years & 8-9 years.

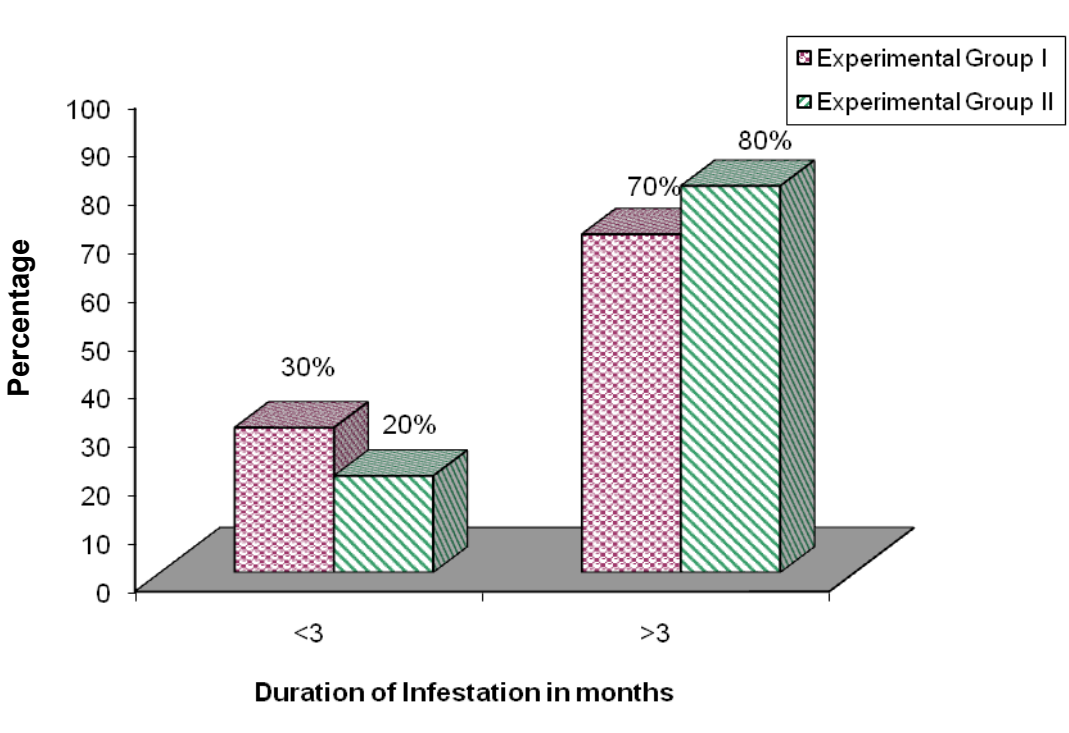


Figure 4.2: Distribution of children according to duration of infestation

The above figure depicts that most of the children, 21(70%) in experimental group-I and 24 (80%) in experimental group-II were having infestation more than 3 months.

Remaining 9 (30%) children in experimental group-I and 6 (20%) children in experimental group-II were having infestation less than 3 months.

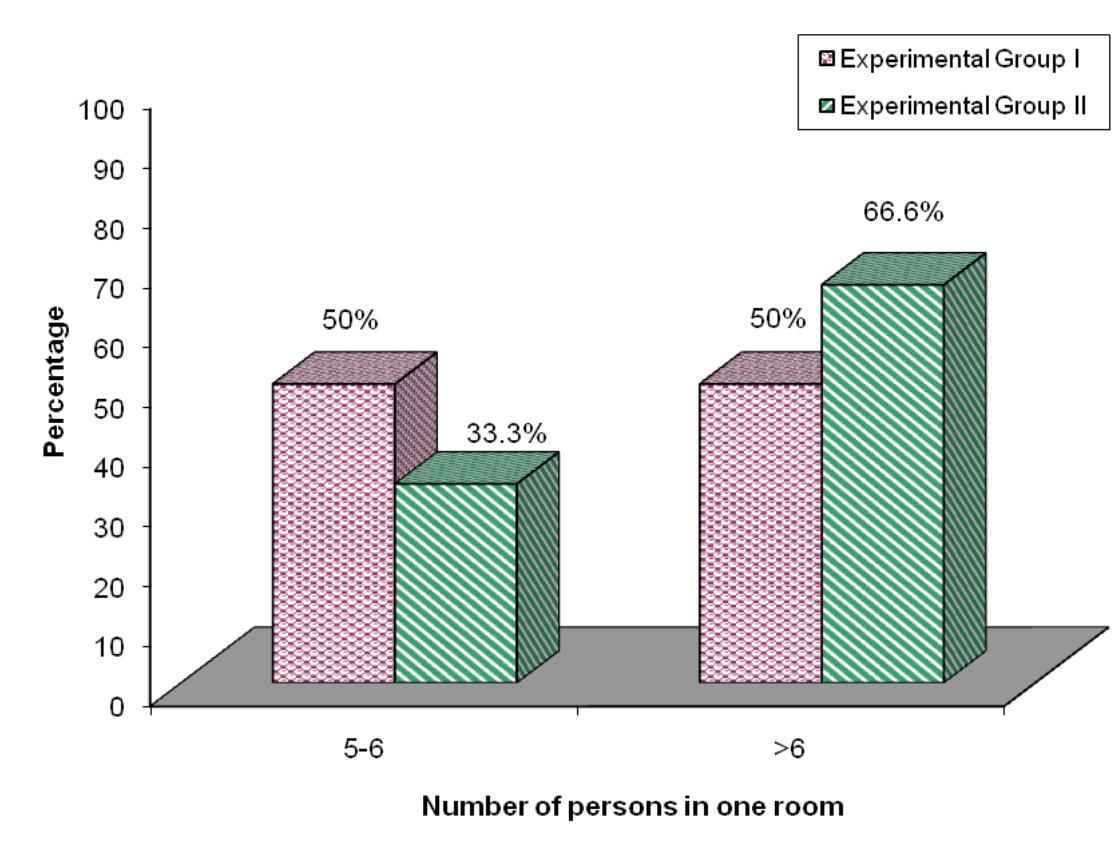


Figure 4.3: Distribution of children according to number of persons in one room

The above figure depicts that equal percentage of the children, 15 (50%) in expermental group-I were staying in a room with more than 6 members. Same as in experimental group-II highest percentage of the children, 20 (66.6%) were staying in a room with more than 6 members.

In experimental group-II the remaining 10 (33.3%) children were staying in a room with 5-6 members.

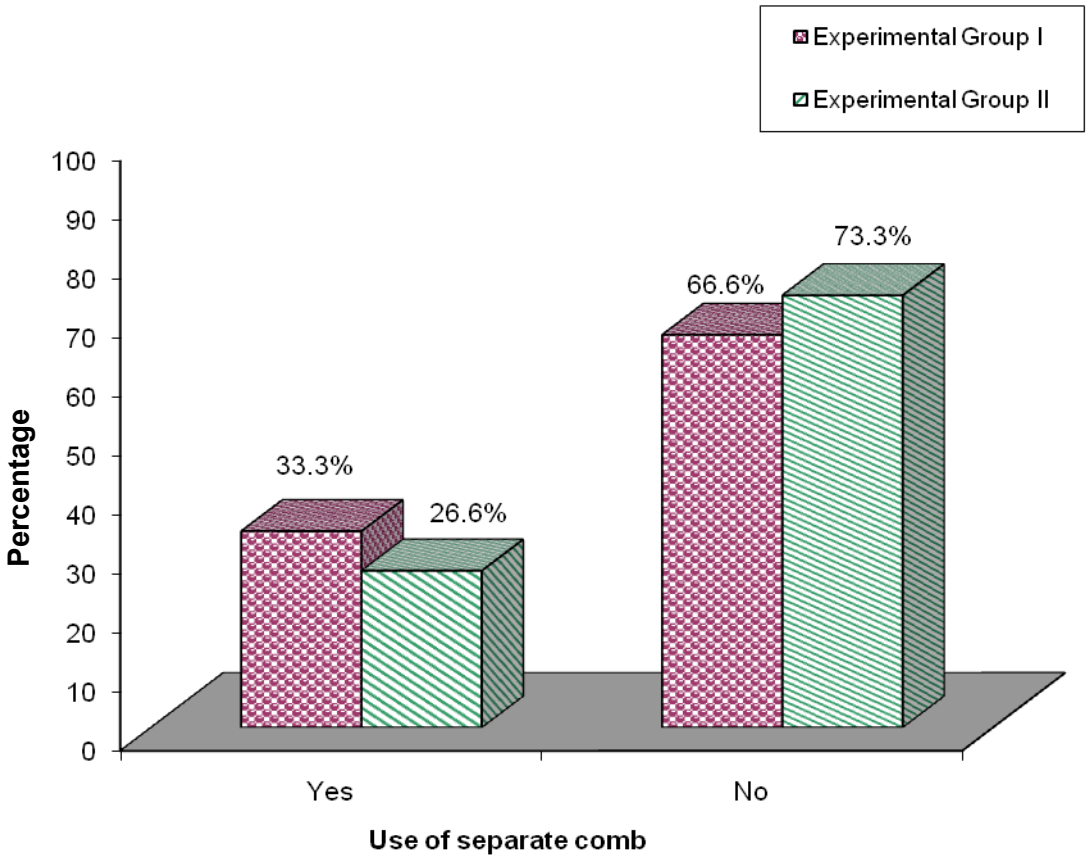


Figure 4.4: Distribution of children according to use of separate comb

The above figure depicts that maximum percentage of children, 20 (66.6%) in the experimental group-I and 22 (73.3%) in experimental group-II were not using separate comb.

The lowest percentage of the children, 10 (33.3%) in experimental group-I and 8 (26.6%) in experimental group-II were using separate comb.

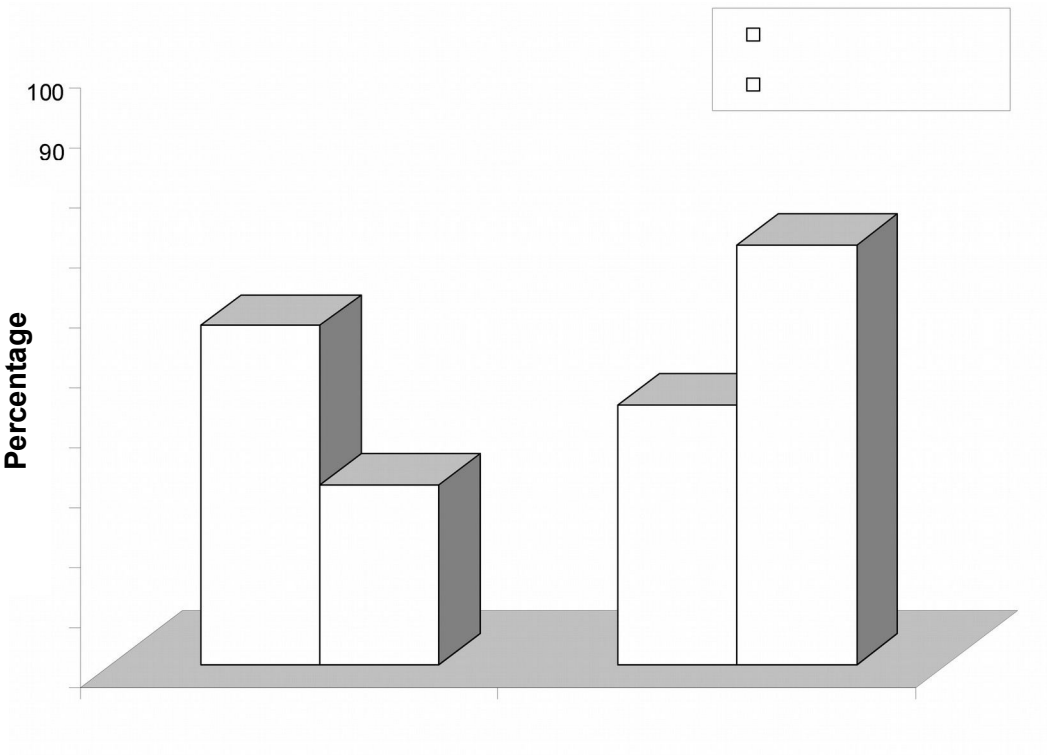


Figure 4.5: Distribution of children according to use of separate towel

The above figure depicts that maximum percentage of the children, 17 (56.6%) in experimental group-I were using separate towel. But in experimental group-II maximum percentage of the children, 21 (70%) were not using separate towel.

The lowest percentage shows that the remaining 13 (43.3%) children were not using separate towel in experimental group-I, whereas 9 (30%) children in experimental group-II were using separate towel.

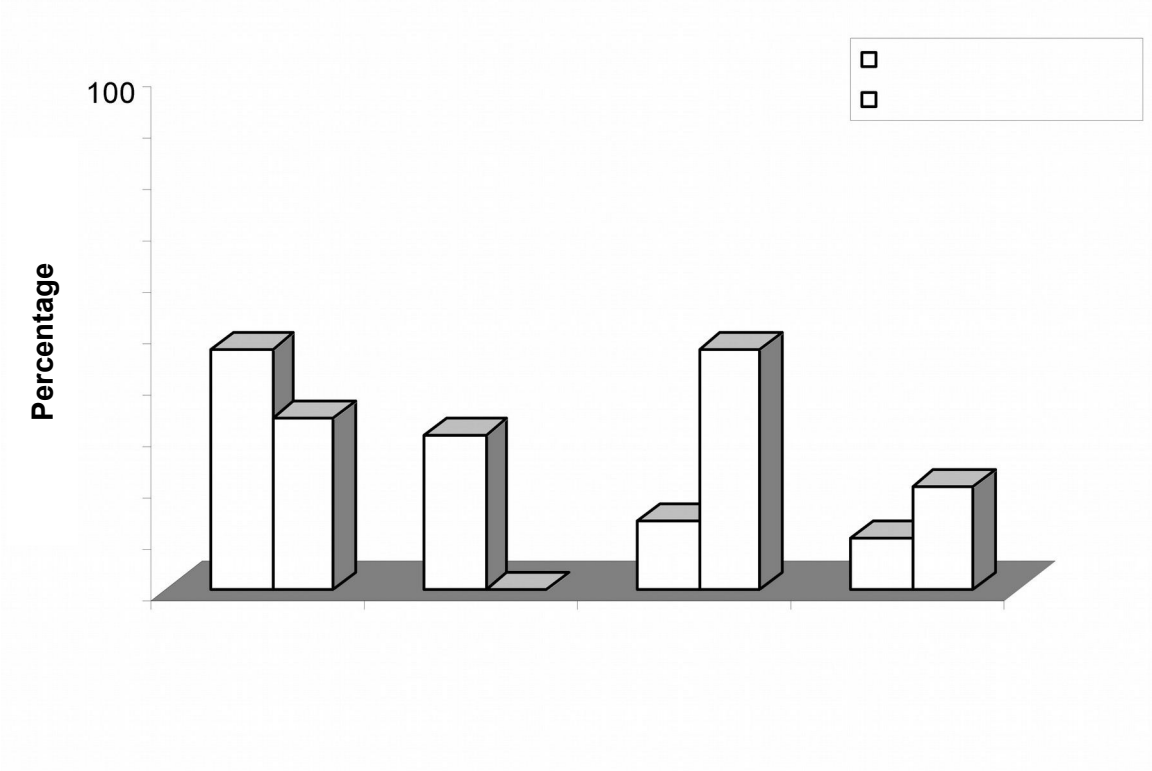


Figure 4.6: Distribution of children according to frequency of hair wash

The above figure shows that, the highest percentage of children, 14 (46.6%) in experimental group-I were washing their hair once in a week. But in experimental group-II, the highest percentage of the children 14 (46.6%) were washing the hair once in two weeks.

The lowest percentage of children, 3 (10%) in experimental group-I and 6 (20%) in experimental group-II were washing their hair occassionally.

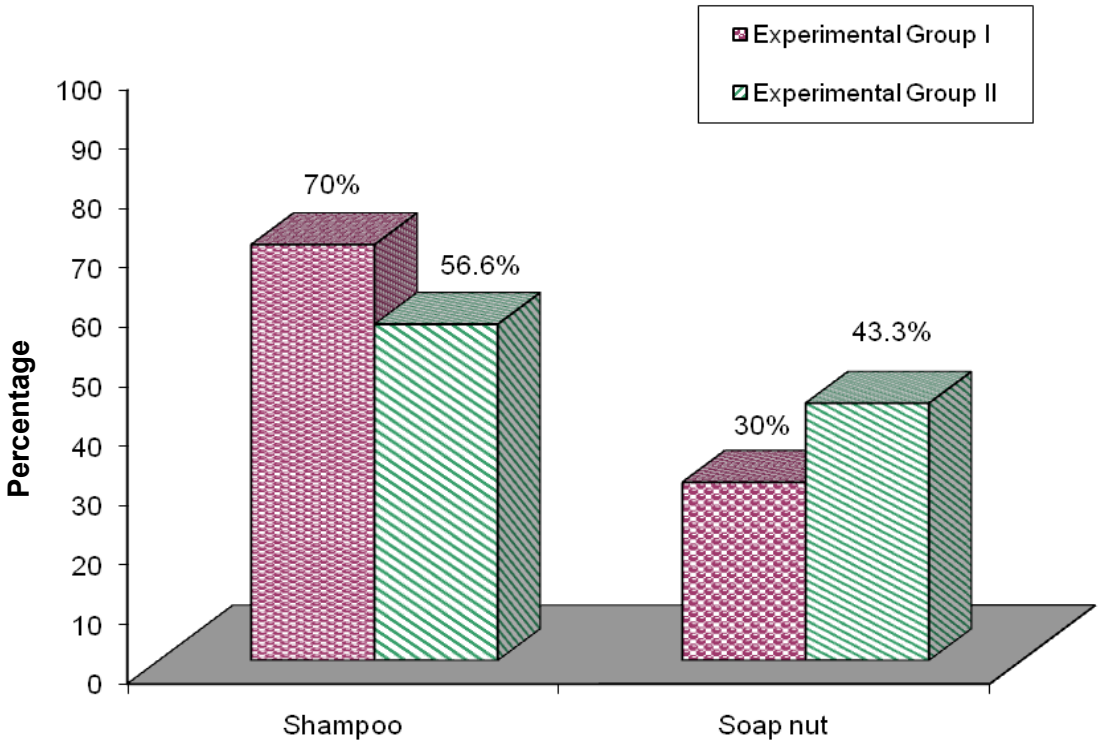


Figure 4.7: Distribution of children according to product used for hair wash

The above figure depicts that, majority of the children, 21 (70%) in experimental group-I and 17 (56.6%) in experimental group-II were using shampoo.

The remaining percentage of the children, 9 (30%) in experimental group-I and 13 (43.3%) in experimental group-II were using soapnut for hair washing. This

may be due to the easy directions to follow during shampooing procedure (Lindsay, W. et. al., 1993).

Previous treatment for pediculosis capitis infestation

Figure 4.8: Distribution of children according to previous treatment for pediculosis capitis infestation

The above figure shows that highest percentage of the children, 16 (53.3%) in experimental group-I were exposed to previous treament. Whereas in experimental group-II almost all the children, 27 (90%) were not exposed to previous treatment.

The remaining 14 (46.6%) children were not exposed to previous treatment in experimental group-I and 3 (10%) were exposed to previous treatment in experimental group-II.

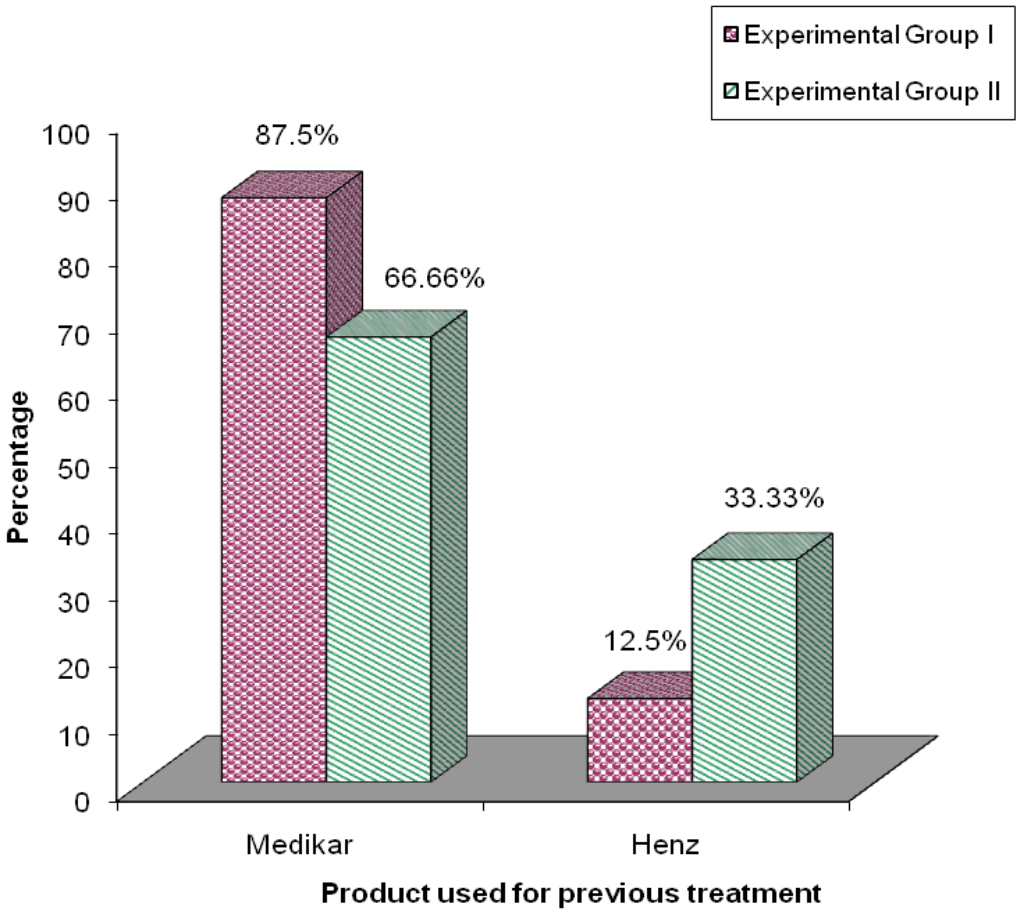
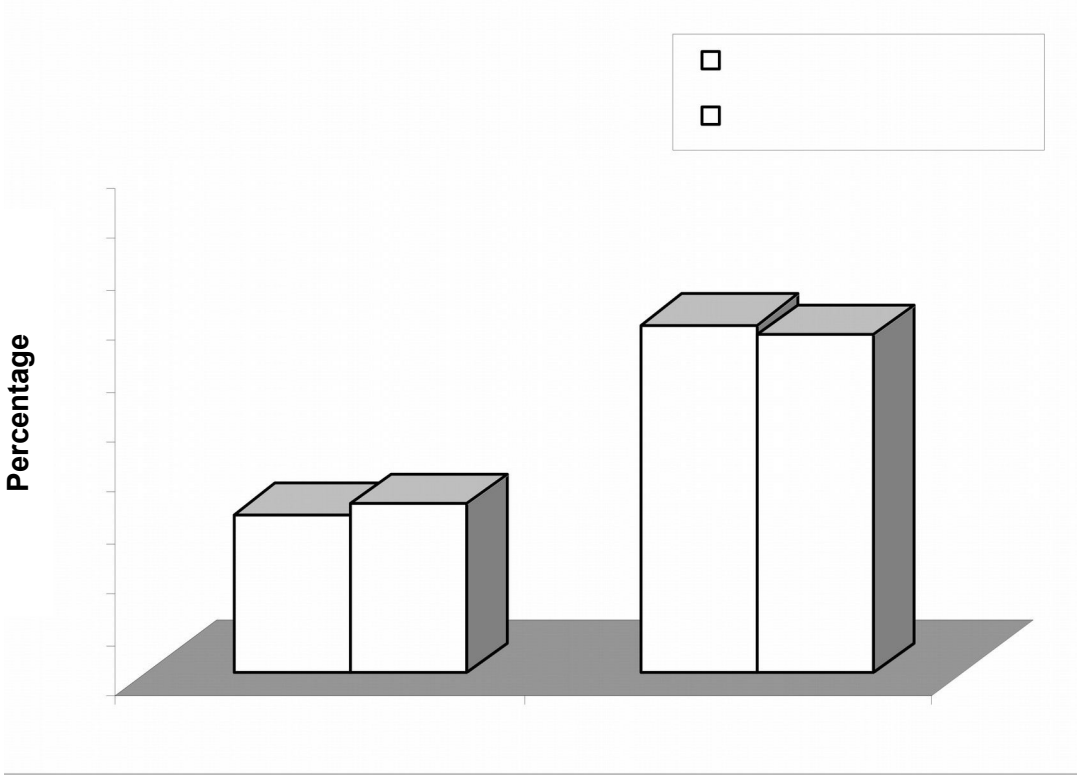


Figure 4.9: Distribution of children according to product used for previous treatment

The above figure shows that most of the children who exposed to previous tretment, 14 (87.5%) in experimental group-I, and 2 (66.6%) in experimental group-II were used Medikar.

The remaining percentage 2 (12.5%) of children were used Henz in experimental group-I and 1(33.3%) in experimental group-II.



Time of previous treatment

Figure 4.10: Distribution of children according to time of previous treatment

The above figure depicts that majority of the children, 11 (68.75%) in experimental group-I and 2 (66.6%) in experimental group-II were exposed to treatment before 6 months.

The remaining 5 (31.25%) children in experimental group-I and 1 (33.33%) in experimental group-II were exposed to treatment before 3 months.

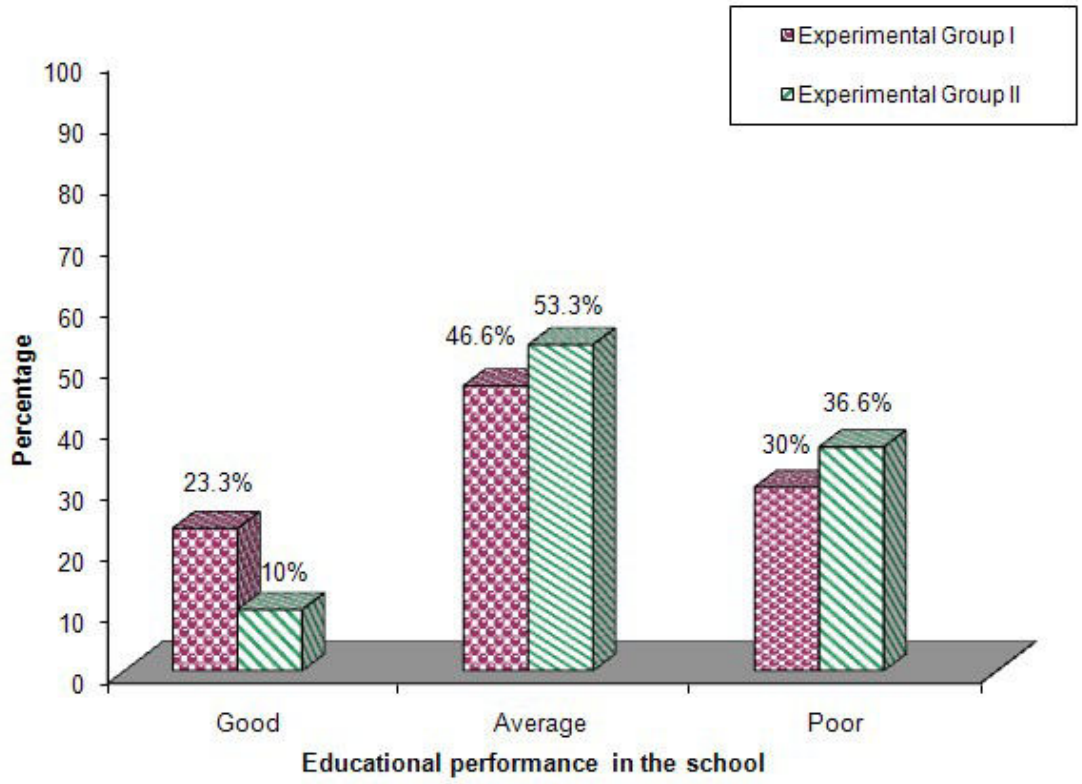


Figure 4.11: Distribution of children according to educational performance

The above figure depicts that majority of the children, 14 (46.6%) in experimental group-I and 16 (53.3%) in experimental group-II were having average educational performance.

Whereas the minimal percentage of children, 7 (23.3%) in experimental group-I and 3 (10%) in experimental group-II had good educational performance.

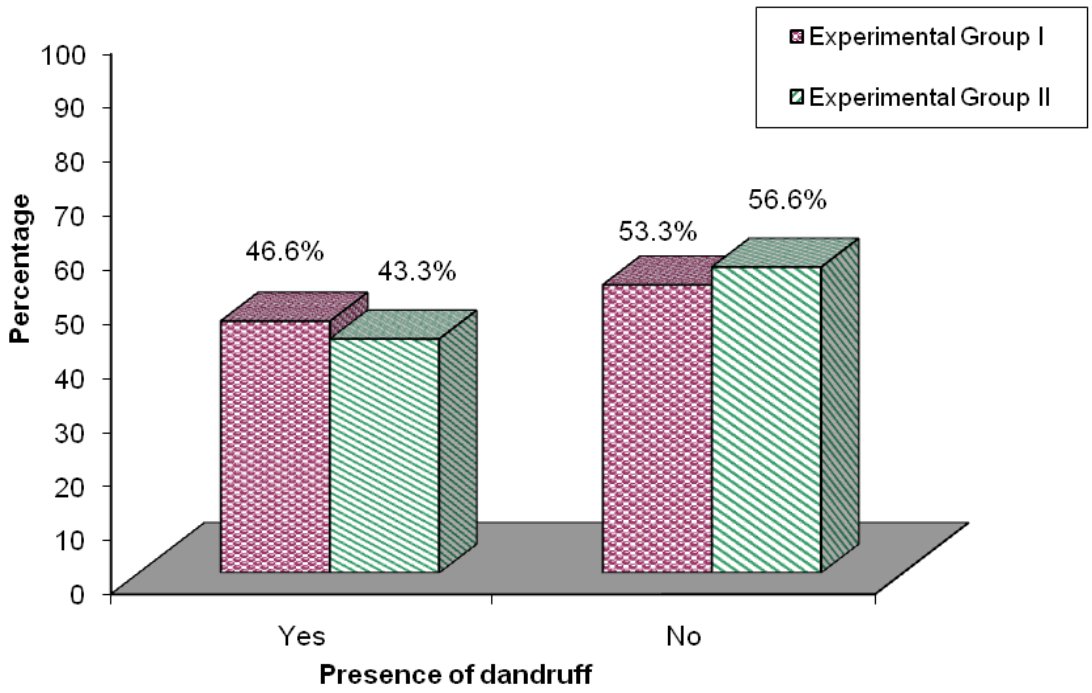
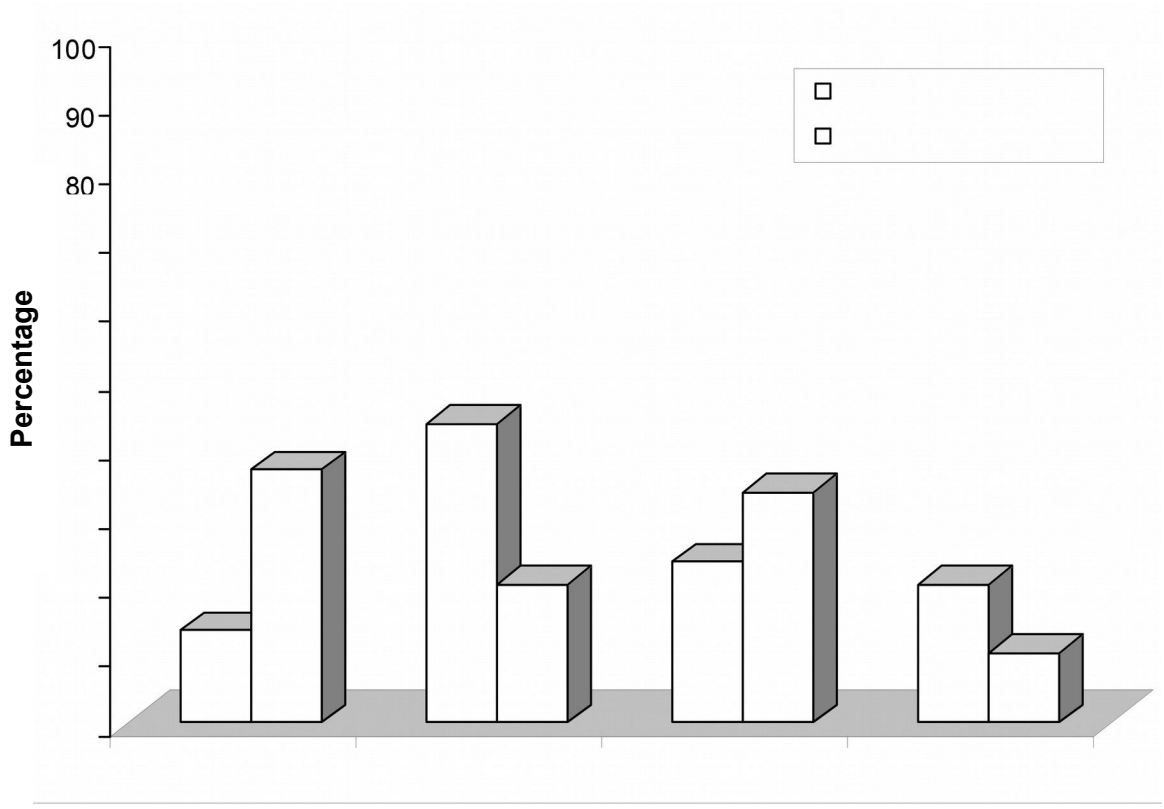


Figure 4.12: Distribution of children according to presence of dandruff

The above figure shows that, majority of the children 16 (53.3%) in experimental group-I and 17 (56.6%) in experimental group-II were having dandruff.

Whereas the remaining 14 (46.6%) children in experimental group-I and 13 (43.3%)children in experimental group-II were not having dandruff.



Duration of stay in orphanage

Figure 4.13: Distribution of children according to duration of stay in orphanage

The above figure shows that highest percentage of children 13 (43.3%) were staying in orphanage for 1-3 years in experimental group-I. But in the experimental

group-II the highest percentage of children 11 (36.6%) were staying in orphanage for less than one year.

The lowest percentage of the children 4 (13.3%) children in experimental group- I were staying in the orphanage about less than one year and 3 (10%) children in experimental group-II were staying in the orphanage about more than 3 years.

SECTION-B

DISTRIBUTION OF CHILDREN ACCORDING TO THE SEVERITY OF PEDICULOSIS CAPITIS INFESTATION BEFORE INTERVENTION IN EXPERIMENTAL GROUP-I AND II

Table-4.1: Frequency and Percentage Distribution of Children according to their Pre-Test Score on Severity of Pediculosis Capitis Infestation in Experimental group-I and II

n=60

Severity of pediculosis capitis infestation	Pre-test			
	Experimental group-I n=30		Experimental group-II n=30	
	F	%	F	%
Mild infestation	-	-	-	-
Moderate infestation	25	83.33	17	56.66
Severe infestation	5	16.66	13	43.33

This table shows that, in the experimental group-I, 25 (83.33%) of the children had moderate infestation and 5 (16.66%) children had severe infestation in the pre-

test. In the experimental group-II, 17 (56.66%) children had moderate infestation and 13 (43.33%) children had severe infestation in pre-test.

SECTION-C

COMPARISON OF SEVERITY OF PEDICULOSIS CAPITIS INFESTATION BEFORE AND AFTER THE INTERVENTIONS AMONG CHILDREN IN EXPERIMENTAL GROUP-I AND II

Table-4.2: Frequency and Percentage Distribution of Children in Experimental group-I and II according to their Pre & Post-test Score on Severity of Pediculosis Capitis Infestation

n=60

Severity of pediculosis capitis infestation	Experimental group-I n=30				Experimental group-II n=30			
	Pre-test		Post-test		Pre-test		Post-test	
	f	%	F	%	f	%	F	%
Mild infestation	-	-	26	86.66	-	-	6	20
Moderate infestation	25	83.33	4	13.33	17	56.66	23	76.66
Severe infestation	5	16.66	-	-	13	43.33	1	3.33

The above table shows that, in the experimental group-I, most of the children 25 (83.33%) had moderate infestation in the pre-test, whereas in the experimental group-II, maximum percentage of children 17 (56.66%) had moderate infestation and the remaining 13 (43.33%) children had severe infestation in pre-test.

In experimental group-I most of them 26 (86.66%) had mild infestation in post-test, whereas in experimental group-II majority of them 23 (76.66%) had moderate infestation, only 6 (20%) of them had mild infestation in the post-test.

Table-4.3: Mean, SD and Mean Percentage Difference on Severity of Pediculosis Capitis Infestation among Children before and after the Interventions in experimental group-I and II.

n=60

Group	Pre-test			Post-test			Difference in mean %
	Mean	SD	Mean %	Mean	SD	Mean %	
Experimental group-I (n=30)	5.83	0.99	64.81	2.57	0.82	28.52	36.29
Experimental group-II (n=30)	6.43	1.17	71.48	4.37	1.33	48.52	23.28

The above table shows that in the experimental group-I, the pre-test mean score was 5.83 ± 0.99, which was 64.81% of total score, whereas in experimental group-II the pre-test mean score was 6.43 ± 1.17, which was 71.48% of total score. However, in the experimental group-I the post-test mean score was 2.57 ± 0.82, which was 28.52% of total score, whereas in experimental group-II post-test mean score was 4.37 ± 1.33, which was 48.52% of total score.

The mean percentage difference of experimental group-I was 36.29% and experimental group-II was 23.28%, which reveals that the neem oil with vinegar was more effective than Medikar shampoo on pediculosis capitis infestation.

Table-4.4: Mean, SD and Mean Percentage Difference on Severity of Pediculosis Capitis Infestation among the Children after the Interventions in experimental group-I and II.

n=60

Severity of infestation	Post test						Difference in mean %
	Experimental group-I (n=30)			Experimental group-II (n=30)			
	Mean	SD	Mean %	Mean	SD	Mean %	
	2.57	0.82	28.52	4.37	1.33	48.52	20

The above table shows that in the experimental group-I, the post-test mean score was 2.57 ± 0.82, which was 28.52% of total score, whereas in experimental group-II, the post-test mean score was 4.37 ± 1.33, which was 48.52% of total score.

The difference in mean percentage between experimental group-I & II was 20% that reveals the neem oil with vinegar was effective on pediculosis capitis infestation.

SECTION-D

HYPOTHESES TESTING

Table-4.5: Mean, SD and 't' Value of Effectiveness of Selected Interventions on Pediculosis Capitis Infestation among Children in Experimental Group-I and II.

n=60

Group	Pre-test		Post-test		df	Post-test 't' value	Table value
	Mean	SD	Mean	SD			
Experimental group-I (n=30)	5.83	0.99	2.57	0.82	58	6.94**	3.29
Experimental group-II (n=30)	6.43	1.17	4.37	1.33			

** highly significant ($p<0.001$)

The above table shows that in the experimental group-I, the pre-test mean score was 5.83 ± 0.99, whereas in experimental group-II the pre-test mean score was 6.43 ± 1.17. However, in the experimental group-I the post-test mean score was 2.57 ± 0.82, whereas in experimental group-II post-test mean score was 4.37 ± 1.33.

The independent 't' value was 6.94 which was highly significant at $p < 0.001$ level. Hence, the formulated hypothesis (H_1) is retained.

Table- 4.6: Association between the Severity of Pediculosis Capitis Infestation among children and their Selected Demographic Variables in Experimental group-I & II

n=60

Sl. no	Demographic Variables	Experimental Group-I (n=30)			Experimental Group-II (n=30)		
		Df	$\chi 2$	Table value	Df	$\chi 2$	Table value
1	Age in years	2	3.66	5.99	2	0.36	5.99
2	Duration of infestation	1	0.29	3.84	1	0.14	3.84
3	Number of persons in one room	1	0.24	3.84	1	0.07	3.84
4	Use of separate comb	1	0.48	3.84	1	1.49	3.84
5	Use of separate towel	1	0.68	3.84	1	0.01	3.84
6	Frequency of hair wash	3	12.25 *	7.81	2	0.01	5.99
7	Product used for hair wash	1	0.29	3.84	1	3.84 *	3.84
8	Previous treatment for pediculosis capitis infestation	1	0.43	3.84	1	0.14	3.84
9	If yes, product used for previous treatment	1	2.939	3.84	1	3	3.84
10	When the previous	1	1.04	3.84	1	0.75	3.84

	treatment was given?						
11	**Educational performance in the school**	2	3.12	5.99	2	0.91	5.99
12	**Presence of dandruff**	1	3.27	3.84	1	0.22	3.84
13	**Duration of stay in orphanage**	3	6.34	7.81	3	5.42	7.81

n=

* Significant at $p \leq 0.05$ level.

Chi-square test was calculated to find out the association between the severity of pediculosis capitis infestation among children in experimental group-I and II and their demographic variables.

The above table shows that, in the experimental group-I there was a significant association between the demographic variable frequency of hair wash and severity of pediculosis capitis infestation. In the experimental group-II, there was a significant association between the demographic variable, product used for hair wash and the severity of pediculosis capitis infestation. Hence, the formulated hypothesis H_2 is retained only for these variables.

Summary

The data analyzed by both descriptive and inferential statistical method. The independent 't' value was 6.94 & it shows that neem oil with vinegar was effective in reducing pediculosis capitis infestation than Medikar shampoo.

CHAPTER V

DISCUSSION

The aim of this comparative study was to evaluate the effectiveness of selected interventions on pediculosis capitis infestation among children at selected orphanages, Salem.

Distribution of Children according to their Selected Demographic Variables in Experimental Group-I & II

- Distribution of children according to their demographic variables shows that highest percentage of children, 19 (63.3%) in experimental group-I & 18 (60%) in experimental group-II were in the age group of 10-12 years. The present study findings were supported by the study conducted by Essam El-din A. Nada, et. al., (2006) reveals that pupils older than 10 years had a significantly higher risk to be infested when compared to younger ones (R.R.: 1.57, range from 1.52 to 2.0, O.R.: 1.72, P: 0.0004).
- Most of the children were having infestation more than 3 months in experimental group-I were 21 (70%) & in experimental group-II were 24 (80%). The present study findings were supported by the study conducted by Speare.R. et.al.(1999) which reveals that 47.7% of the children had been infested with headlice in the previous 6 months.
- Fifty percentage of the children,15 were from experimental group-I and 20 (66.6%) children from experimental group-II were staying in a room with more than 6 members.
- Maximum percentage of children not using separate comb in the experimental group-I were 20 (66.6%) & in experimental group-II were 22 (73.3%).

- Maximum percentage of the children, 17 (56.6%) in experimental group-I were using separate towel, but in experimental group-II maximum percentage of the children 21 (70%) were not using separate towel.
- Highest percentage of children 14 (46.6%) were washing the hair once in a week in experimental group-I. But in experimental group-II, the highest percentage of the children 14 (46.6%) were washing the hair once in two weeks.
- Majority of the children, 21 (70%) in experimental group-I and 17 (56.6%) in experimental group-II were using shampoo.ighest percentage of the children 16 (53.3%) were exposed to previous treament in experimental group-I, whereas in experimental group-II almost all the children, 27 (90%) were not exposed to previous treatment.
- Most of the children, who exposed to previous tretment, 14 (87.5%) in experimental group-I, and 2 (66.6%) in experimental group-II were used Medikar.
- Majority of the children 11 (68.75%) in experimental group-I, and 2 (66.6%) in experimental group-II were exposed to treatment before 6 months.
- Majority of the children 14 (46.6%) in experimental group-I and 16 (53.3%) in experimental group-II were having average educational performance.
- Majority of the children 16 (53.3%) in experimental group-I and 17 (56.6%) in experimental group-II were having dandruff.
- Highest percentage of children 13 (43.3%) in experimental group-I were staying in orphanage for 1-3 years. But in the experimental group-II the highest percentage of children 11 (36.6%) were staying in orphanage for less than one year.

The First Objective of the Study is to Assess the Severity of Pediculosis Capitis Infestation among Children in Experimental Group-I and II

- In the experimental group-I, most of the children 25 (83.33%) had moderate infestation in the pre-test, whereas in the experimental group-II, maximum percentage of children 17 (56.66%) had moderate infestation and the remaining 13 (43.33%) children had severe infestation in pre-test.
- In experimental group-I most of them, 26 (86.66%) had mild infestation in post-test, whereas in experimental group-II majority of them, 23 (76.66%) had moderate infestation, only 6 (20%) children had mild infestation in the post-test. The present study finding was supported by the study conducted by Speare.R.et.al., (1999) which reveals that 20% of the children showing active infestation.

The second objective of the study was to compare the effectiveness of selected interventions on pediculosis capitis infestation among children in experimental group-I & II

- In the experimental group-I, the pre-test mean score was 5.83 ± 0.98, whereas in experimental group-II the pre-test mean score was 6.43 ± 1.16. However, in the experimental group-I the post-test mean score was 2.56 ± 0.81, whereas in experimental group-II post-test mean score was 4.36± 1.32. The independent 't' value was 6.94 which was highly significant at $p<0.001$ level. Hence the formulated hypothesis (H_1) is retained. The present study was supported by the study conduct by Abdel Ghaffer., et.,al (2007) revealed that the neem seed extract shampoo proved to be highly effective against all stages of headlice.

The third objective of the study was to associate the severity of pediculosis capitis infestation among children with their selected demographic variables in experimental group-I and II

- In experimental group-I there was a significant association between the severity of pediculosis capitis infestation and the demographic variable, frequency of hair wash. The present study finding was supported by the study conducted by Moradi A.R., et.al., which reveals that there was no significant variation between the frequency of hair washing. The another study conducted by Essam El-din A. Nada,et.al.,(2006)also supported that there was a negative correlation between the frequency of hair washing and head lice infestation, which also agreed with other studies with a significant ratio ($p<0.001$).
- In experimental group-II, there was a significant association between the severity of pediculosis capitis infestation and the demographic variable, product used for hair wash.
- Hence, the formulated hypothesis (H_2) is retained only for these two variables in experimental group-I and II.

Summary

This chapter dealt with the discussion of the study with reference to the objectives and supportive studies. All the three objectives have been obtained and the two hypotheses were retained in this study.

CHAPTER - VI

SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

This chapter consists of summary, conclusion, implications in nursing service, nursing education, nursing administration and nursing research and the recommendation for further study.

SUMMARY

Quantitative evaluative approach with quasi experimental (pre-test post-test) research design was used for this study. Non-probability convenience sampling technique was used to collect data from 60 children with pediculosis capitis infestation between 6-12 years of age in two orphanages, Nesakkarangal at Ayyanthirumaligai and House of Peace at Paruthikadu. The conceptual framework for the study was based on Imogene King's goal attainment theory. Observation checklist was used to assess he severity of pediculosis capitis infestation. The data were analyzed by using both descriptive and inferential statistics. To test the hypotheses independent't' test and chi-square were used.

The findings are summarized as follows,

- Distribution of samples according to their demographic variables, shows that highest percentage of children, 19 (63.3%) in experimental group-I & 18 (60%) in experimental group-II were in the age group of 10-12 years.
- Most of the children were having infestation more than 3 months in experimental group-I were 21 (70%) & in experimental group-II were 24 (80%).
- Fifty percentage of the children,15 were from experimental group-I and 20 (66.6%) children from experimental group-II were staying in a room with more than 6 members.

- Maximum percentage of children not using separate comb in the experimental group-I were 20 (66.6%) & in experimental group-II were 22 (73.3%).
- Maximum percentage of the children, 17 (56.6%) in experimental group-I were using separate towel, but in experimental group-II maximum percentage of the children 21 (70%) were not using separate towel.
- Highest percentage of children 14 (46.6%) were washing the hair once in a week in experimental group-I. But in experimental group-II, the highest percentage of the children 14 (46.6%) were washing the hair once in two weeks.
- Majority of the children, 21 (70%) in experimental group-I and 17 (56.6%) in experimental group-II were using shampoo.
- Highest percentage of the children 16 (53.3%) were exposed to previous treament in experimental group-I, whereas in experimental group-II almost all the children, 27 (90%) were not exposed to previous treatment.
- Most of the children, who exposed to previous tretment, 14 (87.5%) in experimental group-I, and 2 (66.6%) in experimental group-II were used Medikar.
- Majority of the children 11 (68.75%) in experimental group-I, and 2 (66.6%) in experimental group-II were exposed to treatment before 6 months.
- Majority of the children 14 (46.6%) in experimental group-I and 16 (53.3%) in experimental group-II were having average educational performance.
- Majority of the children 16 (53.3%) in experimental group-I and 17 (56.6%) in experimental group-II were having dandruff.
- Highest percentage of children 13 (43.3%) in experimental group-I were staying in orphanage for 1-3 years. But in the experimental group-II the highest

percentage of children 11 (36.6%) were staying in orphanage for less than one year.

- In the experimental group-I, most of the children 25 (83.33%) had moderate infestation in the pre-test, whereas in the experimental group-II, maximum percentage of children 17 (56.66%) had moderate infestation and the remaining 13 (43.33%) children had severe infestation in pre-test.
- In experimental group-I most of them, 26 (86.66%) had mild infestation in post-test, whereas in experimental group-II majority of them, 23 (76.66%) had moderate infestation, only 6 (20%) children had mild infestation in the post-test.
- In the experimental group-I, the pre-test mean score was 5.83 ± 0.98, whereas in experimental group-II the pre-test mean score was 6.43 ± 1.16. However, in the experimental group-I the post-test mean score was 2.56 ± 0.81, whereas in experimental group-II post-test mean score was 4.36± 1.32. The independent't' value was 6.94 which was highly significant at $p<0.001$ level. Hence, the formulated hypothesis (H_1) is retained.
- In the experimental group-I there was a significant association between the severity of pediculosis capitis infestation and the demographic variable, frequency of hair wash.
- In the experimental group-II, there was a significant association between the severity of pediculosis capitis infestation and the demographic variable, product used for hair wash.
- Hence, the formulated hypothesis (H_2) is retained only for these two variables in experimental group-I and II.

CONCLUSION

Conclusion was derived from the findings of the study. In the experimental group-I, maximum percentage of the children 25 (83.33%) had moderate infestation in the pre-test and maximum percentage of them, 26 (86.66%) had mild infestation in post-test. In the experimental group-II, highest percentage of children 17 (56.66%) had moderate infestation and the remaining 13 (43.33%) children had severe infestation in pre-test and majority of them 23 (76.66%) had moderate infestation, only 6 (20%) children had mild infestation in the post-test. It implies that neem oil with vinegar was effective in reducing pediculosis capitis infestation than Medikar shampoo.

IMPLICATIONS

The present study helps to prevent pediculosis capitis infestation among children.

Nursing practice

- Child health nurses are in the position to control pediculosis capitis infestation among children.
- The students can be involved in health education process along with community health nurse and school health nurse in the primary health care.
- All the students and teachers are taught about prevention of pediculosis capitis infestation in order to enrich the knowledge.
- Pamphlets can be distributed to all the students to improve the knowledge.
- Training program can be arranged for schoolteachers in order to influence the healthy life style to the students.
- Promotion of non-chemical approaches can reduce the expenditure on treatment of pediculosis capitis infestation.

- Use of alternative medicines based on herbal products may reduce the side effects, recurrence of pediculosis capitis infestation and resistance to treatment.

Nursing education

- It is important to have educational program on the eradication of pediculosis capitis infestation among children.
- Staff development program can be arranged based on prevention of pediculosis capitis infestation.
- Nursing schools, colleges and institutions can update the knowledge of nursing student to identify the alternative medicines that can be used for treatment of pediculosis capitis infestation.
- Nurses can use various methods like role-play, quiz, puppets show etc., to teach the children about prevention of pediculosis capitis infestation.

Nursing administration

- The nurse administrator coordinates her work along with the schoolteachers, to encourage them to teach the children in the schools.
- Nursing administrator should organize in service educational program regarding prevention of pediculosis capitis infestation.
- The nursing administrator can organize camp in the orphanages.

Nursing research

- Nursing research to be done to find out various other treatment methods to decrease the prevalence of pediculosis capitis infestation.
- It is important to have evidence-based information about the communicability and management strategies for pediculosis to contribute to sound treatment and policy formation.

- Evidence based practice research to be used in order to increase awareness of pediculosis capitis infestation among children.
- Promote effective utilization of research findings on treatment of pediculosis capitis infestation.

Recommendations

- A similar study can be conducted with large sample size to generalize the findings of the study.
- A similar study can be conducted among school going children of urban and rural community.
- A similar study can be conducted in various settings like hostels, day care baby centers etc.
- A similar study can be done with different methods of application with different neem products.
- A study can be conducted with other alternative medicines used for the treatment of pediculosis capitis infestation.

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ANNEXURE –A

Letter seeking and granting permission to conduct research study

From

Praveena.M

II Year M.Sc., (N), Department of child health nursing

Swami Vivekananda College of Nursing,

A. Jettihalli, Dharmapuri-636807.

Through

The Principal

Swami Vivekananda College of Nursing

A.Jettihalli, Dharmapuri-636807.

To

The Managing Director,

Nesackarangal, home for Destitutes,

Kumaran educational charaitable seva Trust

Judge Road, Ayyanthirumangalai, Salem -636008.

Respected Sir,

Sub: Requesting permission to conduct research study reg;

This is to introduce Ms. Praveena. M, final year M.Sc [Nursing] student of our college. She is conducting a research study to be submitted to the Tamil Nadu Dr.M.G.R. Medical University, Chennai in fulfilment of University requirement for the award of M.sc [Nursing] Degree.

Topic: "A comparative study to Evaluate the Effectiveness of Selected Intervention on Pediculosis Capitis Infestation among the Children at Selected Orphanages, Salem.

I kindly request you to permit her to conduct the Research Study in you are esteemed from O2-04-2018 to 30-04-2018. She will adhere to the Institutional Polices and regulation.

ThankYou!

Yours Obediently,

Letter seeking and granting permission to conduct research study

From

Praveena.M

II Year M.Sc., (N), Department of child health nursing

Swami Vivekananda College of Nursing

A.Jettihalli, Dharmapuri-636807.

Through

The Principal

Swami Vivekananda College of Nursing

A.Jettihalli, Dharmapuri-636807.

To

The Managing Director**,**
House of peace,
Chinnathirupathi**,** Salem.

Respected sir**,**

Sub: Requesting permission to conduct Research study reg.

This is to introduce Ms Praveena .M final year M.Sc [Nursing] Student of our college.She is conducting a research study to be submitted to the Tamilnadu Dr.M.G.R. Medical University, Chennai in fulfilment of University requirement for the award of M.SC [Nursing] Degree.

Topic: "A Comparative study to evaluate the Effectiveness of Selected Intervention on Pediculosis Capitis infestation among the Children at Selected Orphanages, Salem".

I kindly request you to permit her to conduct the Research Study in youresteemed Institution from02-04-2018 to 30-04-2018. She will adhere to the institutional policies and regulations**.**

Thanking you.

Yours Obediently,

ANNEXURE –B

Letter seeking and granting permission to conduct a pilot study

From

Praveena.M

II Year M.Sc., (N), Department of child health nursing

Swami Vivekananda College of Nursing

A.Jettihalli, Dharmapuri-636807

Through

The Principal

Swami Vivekananda College of Nursing

A.Jettihalli, Dharmapuri-636807.

To

The Managing Director,

Nesackarangal, home for Destitutes,

Kumaran educational charaitable seva Trust

Judge Road, Ayyanthirumangalai,

Salem -636008.

Respected Sir,

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This is to introduce Ms.Praveena.M, final year M.sc [Nursing] student of our college. She is conducting a research study to be submitted to the Tamil Nadu Dr.M.G.R.Medical University, Chennai in fulfilment of University requirement for the award of M.sc [Nursing] Degree.

Topic: "A comparative study to Evaluate the Effectiveness of Selected Intervention on Pediculosis Capitis Infestation among the Children at Selected Orphanages,Salem.

I kindly request you to permit her to conduct the Research Study in you are esteemed from 24-03-2018 to 31-03-2018. She will adhere to the Institutional Polices and regulation.

Thanking you!

Yours Obediently,

Letter seeking and granting permission to conduct a pilot study

From

Praveena.M

II Year M.Sc., (N), Department of child health nursing

Swami Vivekananda College of Nursing

A.Jettihalli, Dharmapuri-636807.

Through

The Principal

Swami Vivekananda College of Nursing

A.Jettihalli, Dharmapuri-636807.

To

The Managing Director**,**

House of peace,

Chinnathirupathi**,**

Salem.

Respected sir**,**

Sub: Requesting permission to conduct a pilot study reg.

This is to introduce Mrs Praveena .M final year M.Sc [Nursing] Student of our college. She is conducting a research study to be submitted to the Tamilnadu Dr.M.G.R. Medical University, Chennai in fulfilment of University requirement for the award of M.SC. [Nursing] Degree.

Topic: "A Comparative study to evaluate the Effectiveness of Selected Intervention on Pediculosis Capitis infestation among the Children at Selected Orphanages, Salem".

I kindly request you to permit her to conduct the Research Study in youresteemed Institution from24-03-2018 to 31-03-2018. She will adhere to the institutional policies and regulations**.**

Thanking you!

Yours Obediently,

ANNEXURE- C

TOOL FOR DATA COLLECTION

Section A- Demographic variables.

Section B- Observational checklist.

Section - A

Demographic Variables

Instruction

The interviewer will ask question listed below and place a tick (✓) mark against the response given by the respondent. The information will be kept confidential.

Informant: **Sample No:** ☐

Date:

1. **Age in years**
   - a) 6-7 ( )
   - b) 8-9 ( )
   - c) 10-12 ( )
2. **Duration of infestation**
   - a) Less than 3 months ( )
   - b) More than 3 months ( )
3. **Number of persons in one room**
   - a) 3-4 ( )
   - b) 5-6 ( )
   - c) More than 6 ( )
4. **Use of separate comb**
   - a) Yes ( )
   - b) No ( )
5. **Use of separate towel**
   - a) Yes ( )
   - b) No ( )

6. **Frequency of hair wash**

a) Once in a week ( )

b) Twice in a week ( )

c) Once in two weeks ( )

d) Occasionally ( )

7. **What do you use for hair wash**

a) Shampoo ( )

b) Soap nut ( )

c) Herbal products ( )

8. **Previous treatment for Pediculosis Capitis infestation**

a) Yes ( )

b) No ( )

9. **If, yes product used for previous treatment**

a) Medikar ( )

b) Henz ( )

c) Others ( )

10. **When the previous treatment was given?**

a) Before one month ( )

b) Before three month ( )

c) Before six month ( )

11. **Educational performance in the school**

a) Good ( )

b) Average ( )

c) Poor ( )

12. **Presence of dandruff**

a) Yes ( )

b) No ( )

13. **Duration of stay in orphanage**

a) Less than 1 year ( )

b) 1-3 years ( )

c) 4-6 years ( )

d) More than 6 years ( )

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Section - B

Observational Checklist

Tool to assess the severity of pediculosis capitis infestation:

Sl.No	Assessment	Yes	No
1.	Presence of nits within ½ inch of the scalp		
2.	Presence of visible crawling lice		
3.	Scratching at the nape of the neck		
4.	Presence of scratching on the scalp		
5.	Presence of pruritic papules at the nape of the neck or around ears		
6.	Excoriation of the scalp		
7.	Presence of infestation of eye brows or eye lashes		
8.	Presence of cervical lymphadenopathy		
9.	Presence of more than any 2 stages of lice		

Score key

Total score is 9

Yes - 1

No - 0

Severity of pediculosis capitis infestation	Actual score	Percentage
Mild infestation	1-3	0 – 33.33%
Moderate infestation	4-6	44.44 – 66.66%
Severe infestation	**7-**9	77.77 – 100%

Procedure for Application of Neem Oil with Vinegar and Medikar Shampoo

Introduction

Pediculosis is the infestation of the lice in the body. The most common cause of pediculosis is head lice, Pediculosis Capitis.

Neem Oil with Vinegar

This intervention refers to the application of neem oil on the scalp for 10 minutes and combing the hair with vinegar dipped comb.

Medikar Shampoo

This intervention refers to the application of medikar shampoo during hair wash and combing.

Articles Needed

- Gown
- Mask
- Cap
- Disposable gloves
- Small bowl
- Fine toothed comb
- Carbolic solution
- White paper
- Neem oil & Vinegar / Medikar shampoo
- Shampoo

Preparation of the Child

- Explain the procedure to the child.
- Ensure the co-operation of the child.

Procedure for neem oil and vinegar

- Wash hands & wear protective gloves, mask and gown.
- Loosen the hair and remove tangles.
- Part the hair into small sections and apply the neem oil on the scalp and hair.
- Roll up the long hair to the top of the head.
- Comb the hair with vinegar dipped fine toothed comb after 10 minutes.
- Wash the hair with shampoo and dry it.
- Wash the hands.
- Disinfect the articles by immersing them in carbolic solution 1:20 for one hour before washing.

Procedure for Medikar shampoo

- Wash hands & wear protective gloves, mask and gown.
- Loosen the hair and remove tangles.
- Wet the hair, apply Medikar shampoo and massage it well.
- Wash the hair and comb the hair with fine toothed comb.
- Wash the hands.
- Disinfect the articles by immersing them in carbolic solution 1:20 for one hour before washing.

After care

- Assess the condition of the scalp
- Record the procedure
- Replace the articles

ANNEXURE – D

Letter Requesting Opinion and Suggestions of Experts for Content Validity of the Research tool

From

Praveena.M

II Year M.Sc., (N), Department of child health nursing

Swami Vivekananda College of Nursing

A.Jettihalli, Dharmapuri-636807

Through

The Principal

Swami Vivekananda College of Nursing

A.Jettihalli, Dharmapuri-636807.

To

Respected Sir/Madam,

Sub: Requesting the opinion and suggestions of experts for establishing content validity of the research tool.

As I am, M. Praveena II Year M.Sc., (N) department of child health nursing Student of Swami vivekananda College of Nursing, Dharmapuri have selected statement of the problem mentioned below for the research study to be submitted to the Tamil Nadu Dr. M.G.R. Medical University, Chennai for the partial fulfilment of Master Degree in Nursing.

Topic: "A comparative Study to Evaluate the Effectiveness of Selected interventions on Pediculosis Capitis among Children in Selected Orphanages, Salem".

I kindly request you to validate the tool, content of neem oil, vinegar and pediculosis capitis, and give your expert opinion for necessary modification. I will be grateful to you for this.

Thanking you.

Yours obediently,

[M.Praveena]

Encl: 1. Certificate of validation

2. Criteria check list for evaluation of tool & content

3. Tool for collection of data

4. Content of Pediculosis Capitis, neem oil and vinegar

ANNEXURE-E

CERTIFICATE OF VALIDATION

This is to certify that the tool developed by Ms Praveena M.,Final year M.sc Nursing Student of Swami Vivekanandha college of Nursing,Dharmapuri. [affiliated to the Tamilnadu Dr.M.G.R.Medical University] is validated and can proceed with this tool and content for the main study entitled **"A ComparativeStudy to evaluate the Effectiveness of Selected intervention on Pediculosis Capitis among Children in Selected Orphanages,Salem".**

Signature with seal

Name:

Designation:

Date:

ANNEXURE-F

List of Experts for content validity

1. Mrs. Maheswari, M.sc (N),

Professor cum HOD, Dept.of paediatric ,

Pallakkapalayam,

Dhanvantri College of Nursing,

Erode -687303.

2. Mrs. Sathyakala, M.sc (N),

Assistant professor , Dept of paediatric ,

Vinayaga mission college of Nursing,

Salem.

3. Dr. Kanagaraj , M.B.B.S .,MD.(DVL),

Consultant,

Dr .Kanaks Skin ,Hair,&Cosmetology Clinic,

B-17, Rajaji Street,Swarnapuri, Salem- 636 004.

4. Dr .S. R. Rani ,

Chief Civil Surgeon,

Tutor in paediatrics, Govt Mohan Kumaramangalam

Medical College and Hospital,

Salem -636 001.

5. Mrs.Rekha M.sc (N),

Associate professor

Child Health Nursing Department,

Pallakkapalayam,

Dhanvantri College of Nursing,

Erode -687303.

ANNEXURE –F

Chi-Square Test

Table- 4.6:

Association between the Severity of Pediculosis Capitis Infestationamong children and their Selected Demographic Variables in Experimental group-I&II

Sl. No	Demographic Variables	Experimental Group I (n=30)					Experimental Group II (n=30)				
		Moderate	Severe	Df	$\chi 2$	Table value	Moderate	Severe	Df	$\chi 2$	Table value
1.	**Age in years**										
	6-7	1	1	2	3.66	5.99	3	3	2	0.36	5.99
	8-9	9	-				4	2			
	10-12	15	4				10	8			
2.	**Duration of infestation**										
	Less than 3 months	7	2	1	0.29	3.84	3	3	1	0.14	3.84
	More than 3 months	18	3				14	10			
3.	**Number of persons in one room**										
	3-4	-	-	1	0.24	3.84	-	-	1	0.07	3.84
	5-6	12	3				6	4			
	More than 6	13	2				11	9			
4.	**Use of separate comb**										
	Yes	9	1	1	0.48	3.84	6	2	1	1.49	3.84
	No	16	4				11	11			
5.	**Use of separate towel**										
	Yes	15	2	1	0.68	3.84	5	4	1	0.01	3.84
	No	10	3				12	9			
6.	**Frequency of hair wash**										
	Once in a week	12	2	3	12.25 *	7.81	5	4	2	0.01	5.99
	Twice in a week	9	-				-	-			
	Once in two weeks	1	3				8	6			
	Occasionally	3	-				4	3			

7.	**What do you use for hair wash**			1	0.29	3.84			1	3.84 *	3.84
	Shampoo	18	3				7	10			
	Soap nut	7	2				10	3			
	Herbal products	-	-				-	-			
8.	**Previous treatment for pediculosis capitis infestation**			1	0.43	3.84			1	0.14	3.84
	Yes	14	2				2	1			
	No	11	3				15	12			
9.	**If yes, what?**			1	2.94	3.84			1	3	3.84
	Medikar	13	1				-	2			
	Henz	1	1				1	-			
	Others	-	-				-	-			
10.	**When the treatment was given?**	-	-	1	1.04	3.84	-	-	1	0.75	3.84
	Before one month										
	Before 3 months	5	-				-	1			
	Before 6 months	9	2				1	1			
11.	**Educational performance in the school**			2	3.12	5.99			2	0.91	5.99
	Good	6	-				1	2			
	Average	13	2				10	6			
	Poor	6	3				6	5			
12.	**Presence of dandruff**			1	3.27	3.84			1	0.22	3.84
	Yes	9	4				8	5			
	No	16	1				9	8			
13.	**Duration of staying in orphanage**			3	6.34	7.81			3	5.42	7.81
	Less than one year	1	2				9	2			
	1-3 years	13	1				2	4			
	4-6 years	6	1				4	6			
	More than 6 years	5	1				2	1			

*significant at p≤0.05 level